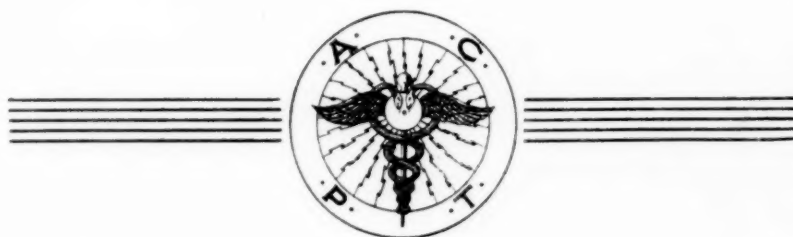


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September 6, 7, 8, 9, 1944

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Volume XXV

JULY, 1944

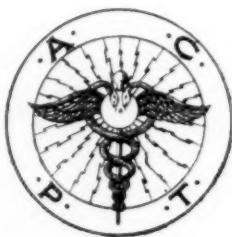
No. 7

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# Contents—July 1944

Volume XXV

No. 7

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## LOCAL ASPHYXIA AND THERMAL MODIFICATIONS IN THE TREATMENT OF TUMORS

FREDERICK M. ALLEN, M.D.

From the City Hospital, Welfare Island, New York

NEW YORK, N. Y.

In addition to studies of temporary ligation of normal or infected tissues at various temperatures, I formerly reported several thousand experiments on tumors,<sup>1-9</sup> showing that suitable local asphyxia causes a considerable breaking down of all kinds of neoplasms and sometimes accomplishes an actual cure. This action is selective; the normal tissues about the tumor are merely inflamed and not a single normal cell is destroyed. A cure resulted in the only case in a human being that was observed, that of a squamous cell carcinoma of the face.<sup>4</sup> The method is not recommended at present for clinical adoption but is believed to be of experimental interest.

According to several observations in the literature, elevations of temperature may have a somewhat injurious effect on tumors, and great interest was attracted by Temple Fay's investigation of the inhibition and regression resulting from cold. Stopping circulation by a tourniquet changes conditions, particularly in two ways: A. It makes possible a more precise, uniform and radical through-and-through alteration of temperature. B. It changes and magnifies the thermal effects. The preservation of asphyxiated tissues by cold has now become familiar. On the other hand, the acceleration of metabolism in asphyxiated tissues by heat is so destructive that brief elevations merely within the febrile range of temperature rapidly lead to gangrene. Correspondingly, immersion in ice water protects tumors against the necrotizing influence of ligation, while immersion in warm water accelerates destruction in both the tumor and the normal tissues.<sup>8</sup> Physical therapy physicians may possibly find other employment for these thermal influences in combination with asphyxia, but certain cases in the present paper illustrate a new use in the treatment of tumors, namely application of cold to protect the normal parts of a limb and of heat to augment injury to the tumor.

The first case merely adds an example of cure of a tumor by unmodified local asphyxia.

CASE 1. — W. J., a laborer aged 46, was admitted to the service of Dr. Lyman Weeks Crossman in the City Hospital, New York, on Nov. 19, 1942, because of an ulcer of the left shin. He appeared to be in fairly good general health and strength, but a quiescent infiltration of the apex of the left lung was demonstrated clinically and by roentgenogram, and the Wassermann reaction of the blood was 3 plus. He smoked two packages of cigarettes daily and denied alcoholism, but the latter was suspected as the cause of a poor appetite, which had made him lose 15 or 20 pounds in several months prior to admission. (His height was 5 feet, 9 inches and his usual weight 135 pounds.) His hands and feet sometimes became cold and numb either in cold weather or with excitement. Injuries of his face always healed quickly, but he frequently sustained small wounds of the hands or feet which healed slowly and with difficulty. On admission he had two cigaret burns and one superficial cut of the right hand which had been present several weeks without healing and which healed gradually under care in the hospital. The syphilis was not treated.

At the middle of the left tibia there was a superficial ulcer measuring about 6 by 3 cm., with a purulent floor apparently composed of pale sluggish granulation tissue. During the usual ulcer treatment it slowly enlarged. There had been a spontaneous onset about a year previously, and slow growth had followed. Ten days before ad-

mission an accidental blow on the ulcer had caused swelling and inflammation, which was the reason for the patient's seeking hospital care. The resistance to treatment prompted a search for a syphilitic, tuberculous or neurologic cause, but a biopsy specimen taken on November 30 unexpectedly revealed squamous cell carcinoma. There were typical invading cords of cells both in the ulcer and in the tissue around it, with numerous pearls and whorls.

Amputation was proposed, but on request Dr. Crossman turned the patient over to me, with the understanding that nothing worse than loss of the leg could result. The patient, because of his fear of losing the leg, was exceptionally cooperative in any attempt to save it.

At 8 a. m. on December 12 a tight tourniquet (consisting as usual of two superimposed turns of a  $\frac{1}{2}$  inch pure rubber tube) was applied above the tubercle of the tibia. This was removed at 3:10 p. m. The continuous pain was very severe, being only partly controlled by 3 grains of pentobarbital sodium and  $\frac{3}{4}$  grain of morphine sulfate, and only the patient's fortitude made stronger sedation unnecessary. The complete stoppage of circulation was proved by the oscillogram and by absence of the congestion of the feet which occurs when the stasis is not perfect.

Dr. F. K. Safford, of the physical therapy department of the hospital, made the following temperature observations three and one-half hours after application of the tourniquet: temperature of room, 78 F.; temperature in bed, 83 F. plus; patient's oral temperature 98.2 F.

Thermocouple\* readings were as follows:

|                                  | Right, F. | Left, F. |
|----------------------------------|-----------|----------|
| Skin temperatures —              |           |          |
| Thigh .....                      | 93.8      | 92.5     |
| Calf .....                       | 92.5      | 90.5     |
| Dorsum of foot.....              | 93.8      | 83.5     |
| Great toe .....                  | 91.5      | 80.0     |
| Muscle temperatures, calf —      |           |          |
| Depth $\frac{1}{2}$ inch.....    | 94.5      | 92.0     |
| Depth $1\frac{1}{2}$ inches..... | 96.5      | 92.2     |

During the later hours the leg was fully cadaveric in appearance, with white and bluish mottling. A thin dry crust formed over the ulcer. Contrary to the fears widely prevalent among surgeons, there is no probability of either thrombosis or necrosis of a leg which is asphyxiated by a properly placed tourniquet for seven or eight hours at average room temperature.\*\*

When the tourniquet was released, as stated, at the end of seven hours and ten minutes, there was an instantaneous rush of red color to the foot; the white and bluish areas of the leg changed more gradually, until the entire surface below the tourniquet was bright inflammatory red. A typical "reaction of hemorrhagic congestion" appeared, in that the tumor (including the ulcer and an infiltrated zone around it) turned deep blue and was thus sharply and precisely demarcated from the red of the normal tissues. This reaction is a hopeful but not infallible indication of a favorable result. It persisted for about fifteen or twenty minutes, gradually giving way to a dark color of the tumor. The limb gradually swelled to a boardlike hardness; but it remained pink and the pulse of the dorsalis pedis and the posterior tibial arteries were not obliterated. Paralysis and anesthesia were complete.

During the ensuing few days, a sprinkling of tiny new ulcers appeared around the original one, which theoretically were small extensions of the cancer sloughing out. The general redness and edema subsided, and there was no breaking down of normal tissue anywhere. The ulcer area began to diminish by epithelialization around the edges, but the dark dry crust came off, exposing a floor which in gross appearance seemed to be composed of tumor tissue. A biopsy specimen taken on December 18 confirmed this impression, but the pathologist, Dr. J. R. Lisa, expressed the opinion that beginning hyalinization in the cells and other signs indicated that the tumor was receding. This judgment was corroborated by the continued course of healing, so that by the early days of March the ulcer and tumor were replaced by unbroken healthy skin.

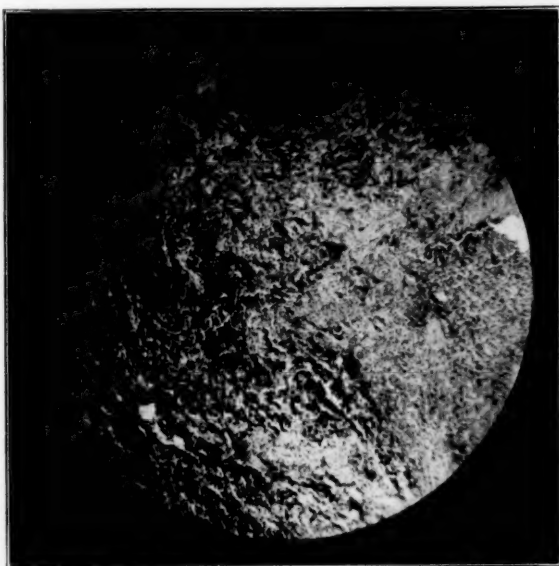
Immediately after the ligation, several inguinal glands developed a hard almond-sized swelling, so that their excision was suggested for investigation of a possible

\* The thermocouple outfit was purchased with a fund from the Council on Physical Therapy of the American Medical Association.

\*\* This experience at room temperature may also serve as a partial answer to the recurring apprehension (Richards V., *Ann. Surg.* 119:178 [Feb.] 1944) that human tissues are dangerously damaged by the application of a tourniquet for as short a time as two hours, even with the protection of refrigeration.

cancerous metastasis. As metastases have never been known to occur with this treatment in animals with far more rapidly growing and resistant types of tumors, it was considered reasonably certain that the gland enlargements were inflammatory, and this belief was confirmed by the subsequent spontaneous devolution.

Meanwhile electrical tests by Dr. Safford indicated wallerian degeneration of nerves of the leg. There was partial atrophy of muscles and partial contracture of the knee. In addition to these ordinary results of prolonged ligation, certain changes occurred which seemed due to the specially poor resistance or healing power in the



Squamous cell carcinoma of the leg, case 1.

patient, namely increasing edema and a severe eczematous eruption with profuse oozing. The weeping edema was cleared up by means of a salt-free diet, and the eruption simultaneously subsided with use of boric acid ointment. The muscle atrophy and contracture responded gradually to physical therapy. Paresthesias and deep pressure sensation were already present. It became possible by tactile tests to trace the regeneration of sensory nerves from the knee downward. Just as in animal experiments, sensory regeneration was more rapid than motor regeneration.

Fixation of the knee and ankle joints resulted because of inexperience with the method and proved more stubborn than the paralysis. Normal sensation and control of all muscles slowly returned as anticipated, and limping diminished as the stiff joints gradually loosened with use. The patient was discharged Dec. 24, 1942 with a functioning leg and no signs of tumor.

CASE 2. — T. B., a laborer aged 61, received treatment at a clinic for a supposed "fungous infection" of the floor of the mouth for eighteen months prior to admission. He then spent fifteen months in two hospitals and was treated intensively for cancer with both roentgen rays and radium. The tumor almost disappeared, but finally resumed rapid growth. The patient lost 50 pounds and was weak and bed fast when received in the City Hospital. The entire floor of the mouth was occupied by an ulcerated and infected tumor mass with a foul odor. The front of the mandible was extensively invaded, with spontaneous fractures, and an infected protuberant growth measuring about 12 by 4 cm. extended from the chin to below the jaw on the left side. The tongue was indurated with growth of the cancer forward and backward so that it was immovable. A few submental nodules were palpable, but there was no discoverable extension to other lymph glands or to the maxilla. The jaws were ankylosed, probably by the intensive radiotherapy rather than by the tumor growth, so that the mouth could not be opened and the patient could barely be fed with a spoon where the teeth were missing in front. These appearances were confirmed by roentgenogram, and a diagnosis of squamous cell carcinoma was established microscopically in a series of biopsy specimens from different areas.

All treatment was considered hopeless because of the emaciation and weakness,

which contraindicated operation, and also the extent of the defect which would result from even a successful excision. The patient and family recognized these facts, but accepted the opportunity of a trial of ligation as a last resort.

Before any radical attempt was made it was desired to learn whether this tumor was amenable to the treatment. Accordingly, the large external mass extending from the chin to the left side of the jaw was surrounded with rubber ligatures by Dr. J. M. Armengol and was left thus completely asphyxiated for six hours. On release there was a prompt development of the usual deep blue color of the tumor and the contrasting red flush of the normal tissues. The patient had a fever, with a temperature as high as 102 F., for a few days, but no other sign of trouble from the ligation. The exposed portions of the tumor sloughed out rapidly. Where it was concealed under normal skin it became doughy and gradually became extruded in gray shreds through preexisting sinuses, there being no breakdown of the normal skin. Probably because of this clearing up of one infected area the patient showed improvement in appetite and strength. The sloughing laid bare extensive dead bone in the mandible. There was no visible regrowth of cancer within the ligated region, but the wound did not heal and nodules became perceptible in the periphery outside of the line of ligation.

Three weeks later a transfusion was given because of anemia, and on the next day a radical procedure was undertaken by Drs. J. W. Armengol and M. B. Nathanson. As a brief anesthesia with pentothal sodium had caused dangerous weakness on the former occasion, no general anesthesia could be risked for this longer undertaking. Therefore a local block anesthesia with procaine hydrochloride was established by Drs. A. M. Foshee and H. G. Natter, with complete success as to avoidance of both pain and depression.

By small stab wounds in the skin followed by blunt burrowing, rubber ligatures were passed around the ramus of the mandible on each side, at a level to permit of compressing the mandibular artery before it entered the bone. The mouth was forced open enough to enable additional ligatures to be passed into it from the skin and out again. A continuous row of such ligatures was placed transversely across the back of the mouth and throat, so that when tightened they completely blocked the blood supply of the entire mandibular region, extending well outside the margin of all observed tumor growth. The patient, asleep under morphine, was returned to his bed in the ward.

The rectal temperature was immediately found to be 104 F., presumably from toxic absorption occasioned by the manipulations in the placing of the ligatures. Because of the higher temperature in the mouth as compared with a limb, and especially with the fever, it appeared imprudent to continue the asphyxia as long as five or six hours. Therefore the rubber ligatures were released after three and three-fourths hours (which was at 8:45 p. m.). All visible tumor inside and outside the mouth became the usual deep blue color, contrasting with the inflammatory red of the surrounding tissues.

The patient remained quietly asleep, without collapse or other symptoms either before or after release of the ligatures. A traction suture had been placed through the tongue, even though it was immovable, as a means of trying to pull it forward if it should swell dangerously, but the swelling proved moderate and harmless. Also, all preparations had been made for a quick tracheotomy if edema of the throat should be threatening, but no such edema occurred. The patient was turned alternately on each side so as to allow the rather abundant thin exudate from the ulcerated tumor to run out of the mouth instead of down the throat. The progress appeared uneventful in the last examination at 12:30 a. m. The rectal temperature at 2 a. m. was 103.8 F. Under existing conditions it was impossible to provide a special nurse. The ward nurse watched particularly for respiratory embarrassment and noticed that the patient continued to sleep quietly and breathe easily. Death occurred without noticeable warning shortly before 5 a. m.

An autopsy was not performed. The natural supposition that bacteria or toxins flushed out of a heavily infected tumor by post-asphyxial hyperemia caused the death of an extremely weak patient was evidently an error. Subsequent experience has shown that the fever rises to its peak while the ligature is in place; that is, before any circulation is restored to the ligated mass of infected tumor. This reaction may possibly be analogous to the hypertension which I have described during ligation of normal organs in animals;<sup>10</sup> but at any rate the utmost precaution must be taken against this danger in this type of cases.



CASE 3. — J. C., a Negro aged 54, had almost complete paralysis on the right side as a result of a stroke suffered three years previously and had spent much of this time in hospitals. He was in the City Hospital, completely bedridden, for the last four months of his life. The diagnosis was hypertensive cardiovascular disease, with large edema of the right foot and leg nearly to the knee. The Wassermann test was negative.

The special point of interest was the additional diagnosis of Kaposi sarcoma of the right thigh and upper leg. This was in the form of some two hundred nodules, ranging from pinhead to pea size, scattered from a few inches below the buttock to a little below the knee. The condition was verified by numerous biopsies, and further description can be omitted because full details are to be published by Drs. Lisa and Persky\* on account of the rarity of this disease in Negroes. There were both interest and doubts in regard to testing how this peculiar type of tumor would react to asphyxia. The patient was transferred from the dermatologic service to Dr. Crossman's surgical service for this purpose.

The large edema of the right foot and leg, which had resisted vigorous diuretic treatment, cleared up rapidly and almost completely with a salt-free diet without medication. Then, as a preliminary trial, Drs. Crossman and Nathanson selected two of the largest nodules and burrowed under and around them with hemostats so as to place rubber ligatures to asphyxiate them thoroughly for six hours. Because of the dark skin, color changes could not be noted, but in the ensuing days the nodules rapidly receded and disappeared without ulceration.

Two weeks later, Dr. Nathanson treated five prominent nodules by a different method, namely by undermining and lifting up each nodule with an oblong of skin around it, so that a light rubber ligature on the skin bridge at each end of the oblong asphyxiated the small area. The asphyxia was maintained for periods of six to seven hours. In two instances the skin bridges were too narrow, so that both tumor and skin sloughed out, leaving superficial ulcers which healed readily. The other three nodules receded and disappeared without ulceration, leaving the normal skin intact. An interesting feature was that the inflammatory reaction resulted in a slight diminution in size of several untreated nodules within a radius of a few centimeters.

Two weeks later, a tourniquet was placed around the thigh well above the tumor area and left for four hours. In order to minimize both constitutional shock and additional vascular injury in the region of edema, ice bags were placed about the foot and ankle, and this cold region was insulated with blankets, while other blankets were wrapped about the tumor-bearing area, which was to be kept warm. Only a mild inflammatory reaction followed, and the tumor nodules receded somewhat but did not disappear.

Four days later, the limb was asphyxiated in the same manner for six hours. The circulatory condition being abnormal, the reactive hyperemia was more sluggish and less intense than in a normal limb. The tumor nodules in the thigh all receded, and the majority seemed to disappear. In the bony region just above and below the knee the inflammatory reaction was least, and here a number of nodules persisted with scarcely any change.

The chronic weakness of the patient, the abnormal circulation in the leg and the practical harmlessness of the small tumors under the circumstances were reasons against proceeding to longer periods of asphyxia, which would have been logical in a strong patient. It was decided that all possible injury must be avoided and that the remaining nodules might be used instructively for trials of the influence of temperature. The previous animal experiments had shown that slight temperature elevations greatly increase the tumor-killing effect but also endanger normal tissues.

In one such trial, a small cradle was placed to surround the knee region, where the few remaining tumor nodules were located, and with one small electric bulb the air temperature inside the cradle was maintained at approximately 98 F. A tourniquet was then applied about the thigh for two and a quarter hours, while the foot and ankle were kept cold with ice bags. An area of normal skin several centimeters in diameter became blistered, illustrating the sensitiveness of asphyxiated tissue to slight warmth, and the superficial ulceration following the blister healed slowly. Direct radiation or other irregular distribution of the heat may have played a part in this result. The small tumors did not ulcerate but receded more markedly than with the preceding longer ligations, so that only one barely noticeable nodule remained.

Two subsequent tests were made on this one nodule, with a tourniquet on the thigh for only one hour. The tumor and a small patch of skin around it were kept immersed in warm water, on the first occasion at 100 F. and on the second occasion at 102 to 103 F. After the second treatment the nodule disappeared, without ulceration.

\* Arch. Dermat. & Syph. In press.

Although the leg was now free from tumors discoverable by ordinary examination, it was noticed that in the hyperemia following the first of these short ligations another nodule became barely visible and palpable and was lost as soon as the hyperemia subsided. The second one hour ligation produced the same result; therefore this time the formation was excised for biopsy. It was found microscopically by Dr. Lisa to be a tiny but typical Kaposi tumor, without any sign of regression or alteration.

The case terminated with a sudden onset of unconsciousness, weakness and slight fever, without a clinically discoverable cause. Death occurred on the third day. The autopsy report will be included in the Lisa-Persky publication. The death was due to bronchopneumonia. In the thigh a few tiny Kaposi nodules were discovered, trivial in number and size in comparison with the original condition.

The Kaposi tumor being of such peculiar character, it is interesting that extensive recessions were obtained rather easily. The duration of ligation that might have been necessary for a radical cure was not undertaken because of the relative harmlessness of the tumor in a patient dangerously weak from other causes. Also, the subnormal vascular reactivity in the leg lessened the postasphyxial inflammation, which is probably the most important factor in a cure.

CASE 4. — M. B., a light-skinned Negress aged 43, was in good health except for a painful keloid at the site of an operation for complete hysterectomy and left salpingo-oophorectomy performed one year previously. Examination showed a straight vertical abdominal scar 12 cm. long and 1.5 cm. wide, elevated from 0.5 to 1 cm. Though not inflamed it was very tender to touch, and the patient complained of constant annoyance and occasional knife like pains. With a view to knowledge of the reaction of a keloid rather than a practical improvement over the customary treatment, a trial of asphyxia was made with the cooperation of Dr. F. K. Safford, of the physical therapy department, and Dr. Emanuel Greenberg, the resident in the gynecologic service. The prior information from animal experiments is that a recently epithelialized scar, pink with new granulation tissue and capillaries, can be selectively broken down by asphyxia; a tough old scar is not thus broken down; the firm fibrous tumors of rats are easily subject to necrosis from asphyxia.

The patient was so hysterical concerning the painful area that she could not endure skin pricks even in a part which was infiltrated with procaine hydrochloride; therefore the procedure was postponed to the next day and was carried out with the patient under brief general anesthesia with pentothal sodium. By the usual series of small punctures for placing rubber ligatures, the entire keloid was ligated in segments, but minor technical faults caused slight uncertainty as to whether the asphyxia was complete in all parts. The ligatures were left in place for six hours.

Promptly after their release, an inflammatory pink color developed in the entire asphyxiated area, without any distinction between the normal skin and the keloid. For two or three days there was no perceptible change except a slight inflammatory edema. At the end of a week there was a difference between the two halves of the keloid. The lower half was slightly shrunken. The upper half was level with the skin, being apparently converted from a keloid to a smooth scar of the same width. The different results might conceivably be accounted for by differences in the degree of asphyxia in different parts. There was no ulceration or open wound except the small punctures, which were slightly infected and drained rather freely. These were sufficient to account for some remaining tenderness of the area, especially on muscular contraction. The former tenderness of the keloid itself was absent, and the patient stated that the knife-like pains no longer occurred. Nerve paralysis from the ligation could explain such a sensory change, at least a temporary one. The patient was discharged three and one-half weeks after the last treatment, in comfortable condition and with an apparently normal scar.

### Summary and Conclusions

Local asphyxia has produced selective and more or less complete destruction of certain tumors in accessible regions. There is no present claim that the method is more effective, safe or convenient than standard treatments, but trials will be continued as opportunities arise.

*(Continued on page 436)*



## DIFFERENTIAL DIAGNOSIS OF RHEUMATOID ARTHRITIS \*

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The widespread manifestations of rheumatoid arthritis vary so markedly from patient to patient that difficulty in differentiating this type of arthritis from other forms of joint disease is frequently encountered. Indeed, in its early stage it may occasionally be confused with other generalized diseases, such as thyrotoxicosis, tuberculosis and psychoneurosis. Diagnosis therefore necessitates the realization that the disease involves the entire body and not the joints alone and that the signs and symptoms vary at different stages.

Typical, advanced rheumatoid arthritis offers no difficulty in diagnosis. The chronic, symmetrical involvement of many joints, with marked thickening of the periarticular tissues and definite deformity, is characteristic. The smaller joints, such as the midphalangeal and the metacarpophalangeal, as well as the large joints, are commonly affected. Muscle involvement is apparent, with rapidly progressive extreme atrophy and weakness and with spasm around the involved joints. Marked atrophy of the skin is common, especially over the hands and lower part of the legs. The generalized nature of the disease is apparent from the constitutional symptoms—fatigability, anorexia and loss of weight—and the marked vasomotor symptoms. The latter usually take the form of “cold, clammy” hands and feet, but symptoms suggestive of Raynaud’s disease are encountered from time to time. Evidence of the involvement of many nonarticular systems is often provided by the presence of lymphadenopathy, splenomegaly, iritis, subcutaneous nodules, anemia, pericarditis and myocarditis.

On the other hand, in the so-called atypical, earlier and less severe form, it is much more difficult to establish the diagnosis. This type is equally characteristic of the disease, however, and probably is more common. Here the joint involvement may be asymmetrical and in many patients may be limited to a single joint for long periods. Furthermore, the tendency for the general constitutional symptoms to overshadow those in the joints may lead one away from the correct diagnosis.

One of the confusing “atypical” forms is that in which the joint symptoms appear after trauma, which not uncommonly precipitates the apparent onset of rheumatoid arthritis. In such cases attention is often focused on the injury; but if joint symptoms do not appear for twelve hours or more after injury, or if they persist for months, one should doubt a diagnosis of traumatic arthritis. Various findings give further indication that the joint symptoms may be due to rheumatoid arthritis. Evidence of involvement of other joints may be obtained by direct questioning as to each joint individually. The most common symptoms elicited in this way and often not brought out in a routine history are stiff neck, “bursitis” of the shoulder, “fallen arches” and pain in the temporomandibular joints. Loss of weight, excessive fatigability or an increase in vasomotor symptoms constitutes fur-

\* From the Medical Clinic of the Massachusetts General Hospital and the Department of Medicine, Harvard Medical School.

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ther evidence against traumatic arthritis. Persistent thickening of synovial tissues, roentgenologic evidence of subchondral bone atrophy, elevation of the sedimentation rate and marked abnormalities in the synovial fluid in such cases suggest the presence of rheumatoid arthritis. However, since there is no specific criterion which serves as diagnostic proof, it is often difficult to make a definite diagnosis of rheumatoid arthritis until the patient has been followed for a considerable period.

Difficulty in diagnosis arises also in cases in which an acute onset of joint symptoms occurs after an infection of the respiratory tract or other infection. In many cases the joint manifestations of rheumatoid arthritis first appear after an infection. Of our initial series of 300 cases, infection was the precipitating factor in approximately 20 per cent. However, the course in such cases can usually be distinguished easily from that of specific infectious arthritis, in which bacteria are actually present in the joint tissues. Characteristic of the latter disease, probably seen most commonly in gonococcic infections, is an onset with chills and fever and migratory joint involvement, which finally localizes in one or a few joints. The swelling in the joints finally involved extends beyond the joint itself, and the redness and tenderness are usually more pronounced than in rheumatoid arthritis. In a few cases of rheumatoid arthritis, however, the joints are red, hot and exquisitely tender, and resemble in all respects the joints of acute infectious arthritis. A diagnosis of infectious arthritis can often be made by culturing organisms from the joint fluid. Examination of the synovial fluid may be of value in differentiation even when the culture is negative, since the leukocyte count is usually high, with 90 per cent or more polymorphonuclear leukocytes, and the sugar concentration tends to be reduced. Roentgenograms rarely show changes until after the third week of infectious arthritis.

Tuberculous arthritis is almost always monoarticular. In contrast to other types of infectious arthritis, it is gradual in onset, and the involved joint is in general not red, hot or extremely tender. This type is as a rule easily differentiated from rheumatoid arthritis. Roentgenologic evidence of bone destruction and of periostitis, along with the synovial fluid findings of relatively low total and polymorphonuclear cell counts associated with a low sugar concentration, indicates the diagnosis. This can then be corroborated by guinea pig tests on the fluid or by biopsy of synovial tissue.

Typical cases of rheumatic fever offer little difficulty in diagnosis. With rare exceptions the symptoms in any one joint are of only a few days' or at most a few weeks' duration. The joint involvement is migratory, frequently without much redness or swelling and with no residual thickening of periarticular tissues. Often the onset of an attack occurs ten to fourteen days after a streptococcic infection, whereas an attack of rheumatoid arthritis precipitated in such a manner may occur within two or three days of the infection. In less typical cases of rheumatic fever, especially in the rare case of persistent involvement in one joint, lasting for many weeks, with no evidence of cardiac disease, it is often impossible to differentiate between rheumatic fever and rheumatoid arthritis during the first attack.

Mild rheumatoid arthritis in patients over 50 is sometimes misdiagnosed as degenerative joint disease. The demonstration by roentgenogram of degenerative changes, which are to be expected in a large percentage of persons of this age, is considered as confirmation of the diagnosis. Degenerative joint disease, however, is not a systemic disease and does not produce weakness, fatigability, vasomotor symptoms, paresthesias, anorexia and loss of weight. In fact, patients with marked degenerative changes are apt to be overweight. The joint symptoms of pain and stiffness, unlike those in

rheumatoid arthritis, are worse after walking and are relieved by rest, and morning stiffness is not a predominant feature. The joints commonly involved are weight-bearing joints, especially the knees, lumbar portion of the spine, the sacroiliac joints and the hips. In the hands, the terminal phalangeal joints are much more frequently involved than the midphalangeal, and metacarpophalangeal involvement is rare. Also rare is involvement of elbows, wrists and ankles. There is little or no periarticular swelling of the affected joints. Effusions occur only after trauma or exceptionally rigorous use. Examination of the synovial fluid also aids in differentiating rheumatoid arthritis from this disease, since the changes found in the fluids of degenerative joint disease are minimal and resemble those observed in traumatic arthritis. The sedimentation rate is normal in degenerative joint disease. Difficulty in diagnosis usually arises from failure to realize that the two diseases frequently coexist. The roentgenologic evidence of degenerative joint disease is clearcut and characteristic, and frequently only by other means can one determine whether rheumatoid arthritis is superimposed.

The joint involvement of disseminated lupus erythematosus often resembles that of rheumatoid arthritis, but is usually milder. Occasionally the only evidence of joint involvement is arthralgia. The other characteristic signs of lupus, including rash, inflammation of serous membranes, leukopenia and kidney involvement, indicate the correct diagnosis.

Gouty arthritis is usually easy to differentiate. Typical attacks are characterized by an acute onset, severe pain and pronounced redness and swelling, often with subsequent desquamation of the skin. They tend to recur at irregular intervals. Although the big toe is often involved, no joint is exempt. The attacks are self limited and usually last a week to ten days except in the uncommon chronic cases, and even in these a history of recurrent attacks in the past can be obtained. In the interval between acute attacks the patient is entirely free of joint symptoms or signs. The presence of tophi and an elevated serum uric acid content aid in confirming the diagnosis. However, the possibility that another type of joint disease might occur in a patient with hyperuricemia must always be kept in mind.

The term "fibrositis" is used to designate a syndrome that is thought by some to be a distinct disease entity, not related to rheumatoid arthritis. It is applied to a large group of patients whose symptoms consist of general exhaustion and stiffness in joints and muscles after rest. However, since there are no specific diagnostic tests, it is difficult to draw a definite distinction between this syndrome and mild rheumatoid arthritis. In any individual patient seen near the onset of the latter disease it is impossible to determine whether he has "primary fibrositis" or the fibrositis of rheumatoid arthritis. The appearance of objective joint signs, loss of weight or elevation of the sedimentation rate is generally accepted as evidence of rheumatoid arthritis. It is probable that the majority of patients with "fibrositis" have mild rheumatoid arthritis.

It is apparent that rheumatoid arthritis can at various stages resemble a wide variety of diseases. In the mild, atypical forms attention is often focused entirely on the presenting complaint, for instance, a subdeltoid bursitis, "fallen arches," sciatica or low back pain, and the underlying disease is not recognized at the time when therapy would be most effective. In some cases the other manifestations of the disease are not sufficiently marked at this point to warrant a definite diagnosis, but in a larger number of cases, evidence is available to make this possible. Since treatment in the early stage produces most rapid and most marked improvement, tends to prevent deformities and lessens the likelihood of recurrences, recognition of the atypical, early cases is essential.

## THERAPEUTIC VALUE OF GRENZ RAYS IN DERMATOLOGY \*

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The term grenz (borderline) rays was applied by Bucky<sup>1</sup> to electromagnetic oscillations produced by a spherical form of apparatus because he considered these oscillations to lie between the ultraviolet and the roentgen rays. While grenz rays are heterogenous, the majority are of the order of 2 angstrom units. Essentially they are merely roentgen rays of exceptionally long wavelength and large absorption coefficient. They are known also as "w," supersoft, borderline, frontier, infra-roentgen and long wavelength roentgen rays.

Grenz rays are a particularly advantageous therapeutic agent because so many are absorbed in the epidermis and the superficial layers of the cutis that the amount actually reaching the deep network of blood vessels needs scarcely be taken into account. Therefore, larger quantities can be applied to the skin and their therapeutic effectiveness is increased.

According to Eller and Bucky,<sup>2</sup> the biologic effect of these rays differs from that of roentgen rays in that they (a) produce erythema more readily, (b) give greater pigmentation, (c) do not epilate, (d) do not penetrate so deeply and (e) cause an early drop in the leukocyte count, which rapidly returns to normal.

### Uses and Advantages

It is in the field of dermatology, in the treatment of superficial skin conditions, that grenz rays are most useful. Because of the greater degree of safety grenz rays as compared with roentgen waves of shorter wavelength, one can avoid temporary or permanent injury to important organs and to glandular apparatus, such as hair roots, sebaceous glands, sweat glands, testes and eyes. Also, since it is impossible, or at least very difficult, to produce epilation, the use of grenz rays is a method of choice in the treatment of dermatoses of the scalp.

Serious injury due to overdosage, such as ulcers, severe vascular damage and sclerosis of the connective tissue and keratoses does not occur. It is possible at one treatment to expose the whole body, since danger to the blood-forming organs is not present and since roentgen ray sickness never appears.<sup>3</sup> Treatment can be repeated much more frequently than with harder rays. The cumulative effect with suitable doses is minute.<sup>3</sup>

In the treatment of many of the chronic relapsing dermatoses, for which the causative agent is not known, roentgen rays are effective but relapses cannot be prevented and one is limited in the total amount of radiation that can be used. With grenz ray therapy the difference between the toxic dose and the effective amount of radiation is so large that, in ordinary practice, one need not fear an accumulation and irradiation can be repeated as frequently as desired.

Finally, grenz rays constitute no danger to the treating physician or technician and there is no possibility of roentgen ray shock.

\* From the Department of Dermatology, Northwestern University Medical School, Dr. Edward A. Oliver, chairman.



### Disadvantages and Reactions

The most striking disadvantage is the persistent pigmentation following single or repeated doses. This is a serious drawback to the treatment of eruptions about the face and neck and is cosmetically disturbing to the female patient. The pigmentation, however, is only temporary. Another disadvantage which is not serious is that the size of the field of radiation is limited to about 3 inches in diameter, so that the treatment is time consuming, if a large area is to be treated.

Wood and MacKee<sup>4</sup> have stated that sequellae are uncommon. However, a few cases of mild atrophy and telangiectasia have been reported. If the dosage is kept within the limits of that originally designated for grenz rays, i. e. does not exceed 10 kilovolts and 10 milliamperes, undesirable reactions and late skin injuries will rarely occur.

The danger of sequellae can be largely avoided by taking certain precautions. Large doses are unnecessary, and good results can be obtained with comparatively small doses. The margin of safety between the therapeutic dose and that producing damage is so wide that injury to the skin can be entirely disregarded in the treatment of inflammatory conditions.<sup>3</sup>

MacKee and Cipollaro<sup>5</sup> stated that areas treated with 300 r showed decided erythema with forty-eight hours. Pigmentation ensued after about one week but disappeared after several months. In some cases telangiectasia, depigmentation, alopecia and atrophy developed. These authors further stated, however, that they have never observed, even after large doses administered over ten years ago, keratoses, ulceration or roentgen ray cancer following treatment with grenz rays.

Ryan<sup>6</sup> stated that reactions are influenced by (1) age (the younger the patient the greater the reaction), (2) complexion (fair patients reacted with erythema and in dark ones the skin became a heliotrope color), (3) thickness of skin (persons with thick skin showed less reaction than those with normal or thin skin), (4) idiosyncrasy and (5) strength of dose (the larger the dose the greater the reaction and the longer the latent period).

### Clinical Results

It is our belief that whatever failures have occurred in grenz ray therapy have been due to excessive dosage. Our good results have been obtained with fractional treatment. In fractionated application the cutaneous reaction is noticeably less and a larger total quantity can safely be given.

We have used an American machine (Westinghouse) containing a tube with a built-in radiation window and so constructed that water cooling is unnecessary. With this apparatus we were able to produce an erythema employing the following factors: 10 kilovolts, 8 milliamperes and a skin-tube distance of 12 cm., and in one minute exposures we obtained 240 r units. With these factors we obtained an average wavelength of approximately 2 angstrom units. It is important for the doses to be quantitatively and qualitatively correct. The air acts as a filter in grenz ray therapy, so that even a minute change in the focal skin distance results in an important change which affects not only the quality but the quantity of the rays.<sup>3</sup>

We have found that the time intervals between different doses should be as follows: 60 to 120 r, one week; 240 to 300 r, two weeks; 300 to 600 r, three weeks; 700 to 800 r, four weeks; 1,000 r and over, six to eight weeks.

We have found grenz rays safer and superior to roentgen rays in the treatment of the following skin conditions: (1) nevus flammeus, (2)

blepharitis, (3) dermatitis of the external auditory canal, (4) lichen chronicus simplex and (5) scrotal and penile dermatitis.

In the following skin conditions we have used grenz ray therapy when the maximum amount of roentgen ray therapy has been given and its continuance would invite roentgen ray dermatitis: (1) mycosis fungoides, (2) psoriasis, (3) pruritus ani, (4) atopic dermatitis, (5) chronic dermatitis and (6) seborrheic dermatitis of the scalp.

*Nevus Flammeus.* — Up to the present time there has been no satisfactory treatment of nevus flammeus. It is here that grenz rays are most useful.<sup>7</sup> Repeated treatments with these rays will produce a definite bleaching as well as a diminution in size. Lesions on the face appear to be the most sensitive, and young children show a greater reaction than adults. The nevus flammeus is a superficial flat nevus occurring in an area of redness and produced by a network of dilated capillaries. The color is usually bright red, the intensity varying according to the vascularity present. The dosage for children is best begun at about 120 r and worked up gradually. Adults may be given from 1,000 to 2,000 r from the beginning. Treatment should be spaced at intervals of four to six weeks. Large nevi are best treated in several fields. Nevus flammeus should be treated as soon as possible, for the younger the patient the better the result.

*Blepharitis.* — This dermatitis of the eyelids can be treated every five to seven days with fractionated treatment (60 r). It is important in treating blepharitis to treat the scalp, for there is always an associated seborrheic dermatitis. From 120 to 240 r can safely be given to the scalp at one time, and the total dose can reach as high as 1,000 to 1,500 r. This relatively high dose is permissible because a large part of the ray energy is absorbed by the hair.

*Dermatitis of the External Auditory Canal.* — In this skin condition large doses may be given because of the small area involved; 120 to 240 r can be given in one treatment.

*Lichen Chronicus Simplex.* — This dermatitis on the nape of the neck responds favorably to 120 r given every five days.

*Scrotal and Penile Dermatitis.* — Irradiation with grenz rays does not damage the testicles; 120 r can be given every five to seven days.

*Mycosis Fungoides.* — Since relapses are the rule in mycosis fungoides, grenz rays are preferable to roentgen rays. Irradiation with these rays can be repeated frequently. The dose for each treatment is 120 to 240 r.

*Psoriasis.* — Because of the tendency of this disease to relapse, grenz rays are preferable to roentgen rays. The dose is 60 r every five days. Radiation should be used in conjunction with systemic treatment.

*Pruritus Ani.* — Symptomatic effects occur rapidly, and one does not have to worry about roentgen dermatitis and its sequelae occurring in this area. Causal factors that may play a role, such as hemorrhoids, mycotic infections, contact dermatitis, the presence of parasites, and systemic disease must, of course, be corrected. The dose is 60 to 120 r every five days.

*Atopic Dermatitis.* — The dose is 60 to 120 r every five days.

*Chronic Dermatitis.* — The dose is 120 to 240 r every five days.

*Seborrheic Dermatitis.* — As stated, epilation of the scalp does not occur from grenz ray therapy, and this modality is therefore extremely useful in the treatment of seborrheic dermatitis of the scalp. The dose is 120 to 240 r at weekly intervals.

### Summary

It is in dermatology that grenz rays are most useful. There is much



less danger with these rays than with roentgen rays, especially of harm to the glandular apparatus and the male genitalia. They can be used safely on the scalp, without danger of epilation. The rays are comparatively harmless, and the serious injury that occurs from overdosage in roentgen ray therapy does not occur with grenz rays. Roentgen ray sickness never appears. Treatments can be given more frequently, as there is little cumulative effect. There is no danger to the operator and no possibility of roentgen ray shock. The only serious disadvantage to the patient is the temporary pigmentation.

Grenz rays are the treatment of choice for nevus flammeus, blepharitis, dermatitis of the external auditory canal, lichen chronicus simplex and scrotal and penile dermatitis. Because of the relapsing nature of mycosis fungoides, psoriasis, pruritus ani, atopic dermatitis, chronic dermatitis and seborrheic dermatitis of the scalp, grenz rays are much more suitable than roentgen rays.

In our opinion best results are obtained with fractional treatment.

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## EARLY TREATMENT OF INFANTILE PARALYSIS \*

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and

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The primary purpose of this paper is to emphasize the importance of early physical therapy, especially therapeutic pool treatment, in the care of anterior poliomyelitis. A project on the behavior of muscle, carried out at the Crippled Children's Hospital of Marlin, Texas, by Dr. Herbert E. Hipps, orthopedic surgeon, and myself, under a grant from the National Foundation for Infantile Paralysis, will be reported.

This project really began a number of years ago when a boy who had suffered an attack of infantile paralysis about three weeks previously was brought to the hospital and was placed in the therapeutic pool. Some of the residual muscle soreness was still present; therefore the child was allowed only to float and enjoy the warm water. (The temperature of the pool is kept constantly at 98.6 F. for patients with early poliomyelitis. The water is furnished by flowing hot salt wells.) The next day the child reported that the soreness was almost gone, and he wanted to try to move his muscles in the water. He was allowed an assistive active movement or two, to see what he could do. The third day acute soreness had vanished, and he was allowed to begin active muscle reeducation following gentle massage under water. This immediate relief of muscle soreness so impressed us that we decided to try putting every child who came to the hospital with residual muscle sensitivity from infantile paralysis into the pool at once. This practice has been continued ever since. Many patients have been put into the pool within three weeks of the onset, many within two weeks, some

\* Read before the Therapeutic Section of the American Physical Education, Health and Recreation Association, meeting with the American Physiotherapy Association in New Orleans, April, 1942.

in ten days and one on the seventh day. Without exception, the muscle sensitivity was alleviated, and usually within a week. Our one regret is that patients were not brought to the hospital sooner, for we think that the earlier this treatment is started the better. As soon as the sensitivity would leave the muscles, the child would show an interest in the treatment and would want to start moving his muscles in the water. We reported this disappearance of muscle soreness and the rapid regaining of muscle power through early treatment as far back as 1939.<sup>1</sup>

This procedure, it must be remembered, was considered by some to be radical at that time, as many hospitals were putting patients with poliomyelitis into plaster casts for periods of many weeks or months after the onset. Some hospitals were even discontinuing the use of pools, and no motion was allowed until all sensitivity had left every muscle. At the Crippled Children's Hospital, however, no patients were put into plaster casts or splints. The only splints used were supports made of stockinet stretched on the lightest of metal rod or wire frames, of the type used by Dr. C. L. Lowman, of Los Angeles. These were removed for pool treatment. While being transported to and from the pool, the child was supported by canvas splints, and in the water light wooden splints were used when necessary. The following routine was developed for early underwater treatment when muscle sensitivity was present:

1st day: The child is carried to the pool on a canvas stretcher and is supported in the pool by this stretcher. Gentle underwater massage is given to the affected muscles unless the soreness is too intense.

2d day: The procedure is like that of the first day, except that if the child feels that he can and wants to try movement, the physical therapy technician assists him to move through the arc of motion of those muscles which show less sensitivity, each muscle being moved only once or twice. Massage may be more extensive.

3d day: By this time the soreness is usually gone or is so slight that the child is ready and anxious to start the muscle reeducation routine. This is begun with only three or four movements of a muscle, for fatigue must be avoided. All movement must be carefully guided by the patient's reaction. The child at this time may be supported in the water by wooden splints.

Patients given this treatment showed satisfactory muscle improvement, had little muscle atrophy and no deforming contractures. The beneficial psychologic effect would alone make it worthwhile. The condition of these patients was in direct contrast to that of a group brought to our hospital after having been kept in plaster splints or casts until all muscle soreness had subsided. The latter patients showed less muscle improvement (as will be shown later statistically) and had extensive muscle atrophy and innumerable contractures and adhesions. Because of these findings, we decided to investigate more in detail the behavior of muscles which had been paralyzed by anterior poliomyelitis.

The generally accepted view had been that muscles paralyzed by infantile paralysis will regain power if put at rest in plaster for a time after the onset of the disease. Our thesis is simply that the sooner the patient can be placed in a warm pool, the sooner the muscle sensitivity will disappear. Muscle reeducation can then be started earlier and the earlier muscles are actively moved, the less muscle atrophy will be allowed to occur and the more muscle power will return. As a result, contractures will be avoided. In general, a much better end result will be obtained. This is substantiated by Edna E. Farris, who said:<sup>2</sup>

We have found the most pronounced, sometimes even startling improvement in the new poliomyelitis cases which we were able to put in the pool very soon after they were out of quarantine, combining the pool with alternate days of heat and mild massage and later muscle training.

In our study, 88 patients were observed over a period of two and a half years. They varied in age from 6 months to 25 years. Some were first seen very early after contracting the disease and others much later. The grade of care given the patient before he came to our hospital varied from excellent to poor; or he might have had none at all. Two months between the onset of the disease and the first physical therapy was considered a long period before treatment. A briefer interval was called short. In a preliminary chart which we devised, the patient was charted as to his age, the duration of disease before he came to the hospital for treatment, type of treatment he received before he came here, and type of treatment he received here (braces, physical therapy, etc.). The only classification of the previous treatment was as to whether or not it was adequate. If the patient had had less than four months of physical therapy either at the hospital or at home, with exercises supervised by a physical therapy technician, the treatment was considered inadequate. If he did not cooperate in performing his exercises, even over a long period, the treatment was called inadequate. If previous treatment consisted only of the use of braces, this was recorded. If no treatment had been given, this fact was recorded.

During the entire time the patient was under supervision, his muscles were charted at frequent intervals. The standard grading of normal, good, fair, poor, trace and zero was used, with plus and minus for greater accuracy.<sup>3</sup> All muscle testing and charting was done by the same physical therapy technician, so that variation due to personal differences in touch and technic was eliminated. In the recording chart, only the first and the last muscle test grade were recorded for comparison; the amount of improvement the muscle had made over the period of observation could thus be seen at a glance.

In order to simplify the problem of evaluating the amount of muscle improvement in each of the large number of muscles charted, a practicable method of determining the percentage of improvement made by each muscle and by each patient was evolved, as follows:

If a muscle improved more than one grade (for example, from poor to good or better), the improvement was considered to be excellent. If the improvement was of only one grade it was called moderate. If it was of less than one grade it was called slight. If there was no improvement, this was indicated by a zero.

The method of determining the degree of improvement was as follows:

1. The total number of paralyzed muscles for each patient was recorded in one column.
2. The number of muscles showing the various degrees of improvement was recorded in other columns (i. e., the number showing excellent improvement, slight improvement and so on).
3. The percentage of improvement per patient was worked out and recorded in another column; i. e., excellent, 100 per cent; moderate, 75 per cent; slight, 25 per cent; and, of course, none, 0.

In tabulating results, the patients were divided into three age groups for comparison. These were (1) 6 months to 6 years; (2) 6 years through 15 years and (3) 16 years and over. The greatest amount of improvement was gained in the middle group. The children in this group showed more co-operation than those in the first group and had muscles still in the growing stage as compared with fully developed muscles of the third group.

Twenty-three patients were studied to determine the relative efficiency of three types of early treatment.

Group 1 represented early rest. The children in this group were brought to the hospital in plaster casts or else had been thus immobilized until all muscle soreness was gone.

Group 2 represented early physical therapy. The children in this group were brought to the hospital very soon after the onset of the disease and were given underwater treatments immediately.

Group 3 was made up of children who came to the hospital early and had examinations and muscle checks, but for one reason or another did not return for a long time. They had no physical therapy, of course, as they were at home and did as they pleased. The only data on them consisted of the results of two widely spaced muscle tests. Thus we had a satisfactory control group.

Based on the previously explained method of tabulating the percentage of muscle improvement for each patient, the comparative records of these three groups are most interesting:

Group 2 (early physical therapy under water) showed 68.5 per cent improvement.

Group 1 (plaster casts, splints, early rest) showed 33.8 per cent improvement.

Group 3 (no treatment) showed 31.1 per cent improvement.

### Conclusion

The chief significance of this study for persons interested in physical therapy is the evidence provided (1) that muscles which have had no training whatever recover about as well as those which have been kept in casts or at rest for a long period; (2) more important, that patients given early underwater treatment show twice as much improvement as either of the other groups, and (3) that the acute muscular sensitivity will usually leave the muscles within three to five days if the patient is given early under water therapy in a pool of heavy saline water at 98.6 F.

Other conclusions, which were drawn from the various phases of this study, may be stated as follows:<sup>4</sup>

1. Long paralyzed muscles treated by rest in a relaxed position for six to twelve weeks were much more apt to lose than to gain.

2. Muscles that were graded zero, trace and poor and had been paralyzed as long as three months showed no appreciable gain with physical therapy.

3. Muscles that were graded poor plus, fair and good showed considerable improvement with physical therapy.

4. The age group 6 to 16 showed a greater improvement than the younger and the older group.

5. Patients who received early, careful physical therapy showed much better muscle recovery than those treated otherwise.

An intensive study of muscle pathology was made by Dr. Hipps after our study had been finished. Certain conclusions, reported by him in "The Clinical Significance of Certain Microscopic Changes in Muscles of Anterior Poliomyelitis,"<sup>5</sup> should give definite emphasis to the theory that early physical therapy will prove itself to be good preventive medicine. Some of those conclusions may be enumerated here:

1. In a study of 94 microscopic sections of old paralyzed muscles it was found that 50 per cent showed cellular hypertrophy in involved bundles. The significance of this for us is that muscle cells remaining uninjured can be increased in size and strength by exercise.

2. Cellular hypertrophy was invariably found in muscles graded poor or better. The significance for us is that the gain in power in the cells is chiefly in those of the muscles of the upper group, mainly those graded above gravity.

3. No newly formed or regenerating muscle cells were found in any of the sections. This clearly indicates that we cannot hope to build new muscle cells. We must conserve and develop those that are left and prevent them from atrophying.

4. These long paralyzed muscles showed that the muscle cells had undergone muscle atrophy, some sections showing fatty replacement changes and other fibrous replacement changes. Both types of muscle were weak, and the fatty replacement type were uniformly weaker than the fibrous replacement type. From this we may conclude that such recognized training as early underwater therapy might well be used to prevent muscle atrophy and contracture, with the attendant development of such degenerative changes in muscle cells.

5. Of vital importance is the final conclusion, "the interesting fact that those muscles showing fatty changes were muscles which had been immobilized or not used for long periods of time." This certainly bears out the theory that "prolonged inactivity is harmful and probably induces fatty-replacement changes following the atrophy of disuse."<sup>6</sup>

A study of muscle behavior and the microscopic pathologic aspects of muscles recently paralyzed by anterior poliomyelitis was conducted by Dr. Jessie Wright, director, D. T. Watson School of Physiotherapy, University of Pittsburgh School of Medicine.<sup>7</sup> The importance of the pathologic comparisons between early paralyzed and old paralyzed muscles thus made available, can hardly be overestimated.

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## PHYSICAL REHABILITATION AND THE DEPARTMENT OF PHYSICAL MEDICINE IN A NAVAL CONVALESCENT HOSPITAL \*

LIEUTENANT COMMANDER GLENN E. DREWYER, MC-V (S), U. S. N. R.

Physical medicine is being utilized at present by the United States Naval Medical Corps in two categories, the general hospital and the convalescent center. It is to be hoped that in the near future complete departments will be added to the mobile units. Observation has shown that the sooner the disabled can receive physical measures for rehabilitation, the more quickly they are returned to duty. Newman<sup>1</sup> has said, "No hospital can be rated as a modern institution, capable of rendering complete service to the disabled, without a well-equipped and organized physical therapy department."

The practice of physical medicine in a convalescent hospital, although consisting of the same basic procedures, varies considerably from that used in a general hospital. This is due to the type of patients treated and to the necessity for the use of physical medicine in its broader sense. In reality, it would be better to classify the convalescent hospital as a physical rehabilitation center, since this title more aptly designates the over-all plan of treatment for the complete rehabilitation of the disabled sailor.

In the establishing of naval convalescent hospitals, no definite plan of operation was outlined by the Bureau of Medicine and Surgery, except that such centers were for the rehabilitation of medicine and surgical patients, sputum-negative tuberculous patients and neuropsychiatric patients who were not psychotic and could be expected to return to duty.

The large majority of the patients admitted to these centers have been transferred from the more advanced units, perhaps having been to several such units before arriving at a mainland hospital and finally being assigned to a convalescent center. Owing to their long period of hospitalization connected with physical injury, and to severe mental reactions often resulting from battle experience, these patients present a twofold problem in rehabilitation. It is necessary to correct the physical disabilities as well as combat the mental reactions which they present.

In a plan of rehabilitation for such patients, it is necessary to use physical medicine in its broadest sense. This includes the usual procedures of recognized value, occupational therapy, physical training, corrective exercise, recreation, work therapy, education and entertainment.<sup>2</sup> It is necessary to keep the patients occupied, since the long hours of convalescence are boring. The employment of the procedures mentioned in a regular program, fosters habits of diligence and self respect and converts indolent and often discontented patients into happy men who soon begin to feel that they are becoming useful members of society.<sup>3</sup>

In any such plan it is necessary to remember that each patient presents an individual problem and should have definite approach. Owing to the press of war conditions and the lack of adequate medical personnel, a patient is often sent from hospital to hospital without an adequate understanding of his physical disability. The physician has not had time to talk to him and to explain his injury or illness. Thus, the best psychotherapeutic approach is one of kindly interest, with an adequate history and a complete physical examination. This lays the foundation for obtaining the confidence

\* The opinions and assertions contained in this paper are the private ones of the writer and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.



of the patient, and he becomes aware of the fact that a definite effort to assist him is being made. This method has two advantages: It secures the cooperation of the patient in the program and allows a proper evaluation of the problem of rehabilitation in each individual case, so that the patient may be fitted into the plan which will most likely assure his rapid recovery and return to the naval service.

It can be seen that it is essential to have an efficient, well organized plan of approach to the problem of rehabilitation. This paper will deal with a typical modern example of such a plan, devised and in operation at the United States Naval Convalescent Hospital at Glenwood Springs, Colo. Although this plan may not be ideal, at least it is functioning and is one to which improvements can be added as they seem advisable.

In order that the plan and its coordination with the facilities offered may be understood, it is necessary to first outline the natural resources offered at Glenwood Springs.

The United States Naval Convalescent Hospital at Glenwood Springs has several unique features which are extremely valuable for its function as a rehabilitation center.<sup>4</sup> It has three natural hot mineral water springs which have served as a spa to health seekers for over fifty years. The building serving as the hospital is the Hotel Colorado. It required considerable reconstruction before becoming a hospital; however, any difficulties which it still presents are somewhat minimized because it is for convalescent patients only and in no sense is a general hospital.

The world's largest warm mineral water swimming pool is in conjunction with the hospital. This measures 650 feet long by 100 feet at its widest part. The water is supplied by Yampah, the largest of the hot mineral water springs, flowing 3,000 gallons per minute at a temperature of 127 F. The temperature of the water can be controlled by means of the inflow of water from one of the proximate mountain creeks. The water is changed every eight hours. At the smaller end of the pool, a 42 foot circular tank has been constructed. Here the temperature is kept higher than in the remainder of the pool. Two large underwater tables for massage and a set of parallel bars for reeducation in walking and for other underwater exercises have been installed in this part of the pool. It is hoped that in the future, this part of the pool can be enclosed so that greater use can be made of it during the inclement winter months. The pool offers an excellent means of hydrotherapy, with underwater exercise for patients in need of such a regimen, and is ideal for the treatment of patients in the later stages of poliomyelitis. There is a bath house in association with the pool, and the grounds are sufficiently well landscaped to make the whole arrangement a peaceful, quiet place in which to convalesce.

All the hot springs have a similar mineral content, and an analysis of the water done several years ago showed varying amounts of the following substances: sodium chloride, magnesium chloride, sodium bromide, sodium iodide, trace; calcium fluoride, trace; potassium sulphate, calcium sulfate, lithium bicarbonate, magnesium bicarbonate, calcium bicarbonate, silica, ferrous bicarbonate, sodium phosphate, sodium baborate, alumina and organic matter. In addition small amounts of hydrogen sulfide and sulfur dioxide, and a large amount of carbon dioxide, are found in natural spring water, making it, in effect, similar to that of the famous Nauheim baths in Germany, which have been so strongly advocated in the treatment of myositis, neuritis and arthritic conditions.

A smaller spring, close to the pool, has the same type of mineral content

and was formerly used as a source of medicinal drinking water. The water was advocated for gastrointestinal diseases. Its action is similar to that of some of the nationally advertised mineral waters. However, the hydrogogic effect on the intestinal tract is less intense than that of other mineral waters. It seems to act as a gentle flushing agent.

The third spring arises in a cave in the mountain side. The Ute Indians took hot vapor baths in this cave. It was known to them as yama water (medicine water). The cave was subsequently enlarged into three caverns, and a building was built above them. In the cavern, hot water from the spring circulates through troughs in the floor, and the temperature of the caves varies from 102 to 110 F., with a humidity of 87 to 98 per cent. We have used the caverns in selected cases, and have found their use to be of therapeutic value in cases in which a low grade fever, increased blood flow and a general capillary dilatation appear to be indicated. The average rise of oral temperature after twenty minutes in the cavern varies between 2 and 3.4 degrees F.

The building which had been constructed over the caves has been rebuilt into a modern physical therapy unit, with booths for eighteen plinths. This unit is divided into three divisions, a hyperthermia section for the caves, a section for electrotherapy and a section for general physical measures. In the section for hyperthermia there is a fever cabinet where patients requiring higher temperatures for longer periods can be treated. The section for electrotherapy includes such apparatus as short wave machines, a polysine generator and a wall plate used in muscle testing and nerve stimulation. Also included are air-cooled and water-cooled ultraviolet ray lamps. The section for general physical therapy contains radiant heat lamps, bakers and paraffin baths. In this section most of the general physical treatments are done.

The department of hydrotherapy is housed in the bath house in close association with the therapeutic pool. Provision is made for various types of hydrotherapy, e. g., whirlpool and contrast baths, tub baths and underwater massage and exercise. The swimming pool is an extremely valuable asset in the program of rehabilitation; it not only serves as an adjuvant to the therapeutic armamentarium but plays a prominent role in the recreation and athletic program.

We had planned a section on occupational therapy to be placed in the bath house building, but owing to lack of equipment it has not been established. It is hoped that this will be completed soon.

The personnel of the department of physical medicine consists of the medical director, four assistants and technicians. The four assistants have had excellent training in physical therapy technic, and they act in a supervisory capacity over the technicians in the department. They aid also in the treatment in the more complicated cases. Most of the technicians have been graduated from one of the hospital schools of the Navy.

In view of the fact that many of the technicians had received only elementary training, it was deemed advisable to start classes of instruction in the fundamentals of physical medicine to improve the education of the technicians in the clinical application of the various physical procedures. Instruction is supervised by the medical director with the four assistants acting as instructors. Weekly classes lasting two hours are conducted. Such subjects as normal range of motion of joints, the principal muscles involved in the movement of the joints, measurement of joint motion, massage and its proper application, the use of radiant heat, ultraviolet light, its indications and contraindications, the use of short wave therapy, and the Kenny

treatment of poliomyelitis are included in the course. The response of the group to this training has been very pleasing, and already the technicians are doing a higher type of work. It is planned to continue the courses and give more extensive training.

In order to promote and hold the interest of the technical group, the director has assigned each technician a problem, such as the use of electrical currents in nerve regeneration, the use of short wave therapy in post-traumatic syndromes, fibrositis, malaria and filariasis, and the use of ultraviolet light in the healing of wounds. It is encouraging to see the interest technicians show in studying these problems and in following the progress of their patients. The assigning of specific problems has acted as a great stimulus, and every member of the department has developed the proper psychologic approach to the patients.

The weekly refresher course is supplemented monthly by a seminar designed to review the current literature on the newer methods in use in physical medicine. Each technician is assigned some subject to review.

The program of teaching, with the added stimulus for the technicians and the staff, has been sufficient to swing the balance in the proper direction. It has given the technicians a wider knowledge of the problems they face, enabling them to have their patients' welfare fully in mind and stimulating them to more careful consideration of individual problems.

The commanding officer, the executive officer, and the medical staff at the Glenwood Springs Naval Convalescent Hospital saw the need of a steady gradation through heat, massage, mechanotherapy and exercise to accomplish an early return of the patient to duty. Hence the value of cohesion and of cooperation between the various departments, all of which properly controlled make for success in the rehabilitation of the disabled sailor.

A plan was formulated by the members of the medical staff to establish a coordinated effort for the fitting of the individual needs of each patient into a plan of rehabilitation in order to facilitate the early return of patients to service. The plan consists essentially of six main divisions: physical therapy, occupational therapy, work therapy, recreational therapy, education and entertainment. It is being carried out as follows:

As the patients are admitted, they are assigned by the officer of the day to one of the hospital wards. The various services in the hospital are as follows: medicine, surgery, neuropsychiatry, physical medicine and a service for patients who are to be surveyed out of the service.

On the first day after admission new patients are given an orientation talk to acquaint them with the program by either the commanding officer or the executive officer. The speaker outlines our conception and method of approach to the problem of physical rehabilitation. He stresses what the patient can expect from the program and what is expected from the patient in order to facilitate his recovery. The patients are informed as to the liberty periods, and instruction is given to them, as to their relationship with the towns people of Glenwood Springs. Such an orientation period is of extreme value in establishing the proper relationship between the patients and our plan of physical rehabilitation.

The patients on their return to their wards receive a questionnaire relative to their desires in regard to work therapy, recreational therapy and educational therapy (fig. 1). This is returned to the ward medical officer on completion. The ward medical officer reviews each patient's health record and chart; a brief summary of the history is made, and any further details are elicited from the patient. The patient then receives a thorough

U. S. NAVAL CONVALESCENT HOSPITAL  
Glenwood Springs, Colorado

OCCUPATIONAL, EDUCATIONAL AND RECREATIONAL INTERESTS SURVEY

Name \_\_\_\_\_ Rate \_\_\_\_\_ Age \_\_\_\_\_ Ward \_\_\_\_\_

To ascertain your occupational, educational and recreational interests, so that a program may be planned which will take into account your interests, indicate by a check (x) mark in the proper column the activities which interest you.

| <u>O C C U P A T I O N A L</u> |                     |               |                  |                 | <u>E D U C A T I O N A L</u> |                     |               |                  |                 |
|--------------------------------|---------------------|---------------|------------------|-----------------|------------------------------|---------------------|---------------|------------------|-----------------|
|                                | Years<br>Experience | Want to<br>Do | Want to<br>Learn | Can<br>Instruct |                              | Years<br>Experience | Want to<br>Do | Want to<br>Learn | Can<br>Instruct |
| Carpentry                      |                     |               |                  |                 | Mathematics                  |                     |               |                  |                 |
| Painter                        |                     |               |                  |                 | Engineering                  |                     |               |                  |                 |
| Metal Works                    |                     |               |                  |                 | Pennmanship                  |                     |               |                  |                 |
| Auto Mechanics                 |                     |               |                  |                 | English                      |                     |               |                  |                 |
| Electricity                    |                     |               |                  |                 | Spelling                     |                     |               |                  |                 |
| Landscaping                    |                     |               |                  |                 | Art                          |                     |               |                  |                 |
| Baker                          |                     |               |                  |                 | Languages                    |                     |               |                  |                 |
| Cooks                          |                     |               |                  |                 | Radio                        |                     |               |                  |                 |
| Laundry                        |                     |               |                  |                 | Photography                  |                     |               |                  |                 |
| Prosthetic Appliances          |                     |               |                  |                 | Current Events               |                     |               |                  |                 |
| Shoe Cobbler                   |                     |               |                  |                 | Economics                    |                     |               |                  |                 |
| Typewriting                    |                     |               |                  |                 |                              |                     |               |                  |                 |
| Accounting                     |                     |               |                  |                 |                              |                     |               |                  |                 |
| Outside Detail                 |                     |               |                  |                 |                              |                     |               |                  |                 |
| Draftsman                      |                     |               |                  |                 |                              |                     |               |                  |                 |
| Plumbers                       |                     |               |                  |                 |                              |                     |               |                  |                 |

| <u>R E C R E A T I O N A L</u> |                     |               |                  |                 | <u>R E C R E A T I O N A L</u> |                     |               |                  |                 |
|--------------------------------|---------------------|---------------|------------------|-----------------|--------------------------------|---------------------|---------------|------------------|-----------------|
|                                | Years<br>Experience | Want to<br>Do | Want to<br>Learn | Can<br>Instruct |                                | Years<br>Experience | Want to<br>Do | Want to<br>Learn | Can<br>Instruct |
| Baseball                       |                     |               |                  |                 | Badminton                      |                     |               |                  |                 |
| Basket Ball                    |                     |               |                  |                 | Checkers                       |                     |               |                  |                 |
| Soft Ball                      |                     |               |                  |                 | Swimming                       |                     |               |                  |                 |
| Volley Ball                    |                     |               |                  |                 | Skating                        |                     |               |                  |                 |
| Tennis                         |                     |               |                  |                 | Skiing                         |                     |               |                  |                 |
| Bowling                        |                     |               |                  |                 | Fishing                        |                     |               |                  |                 |
| Golf                           |                     |               |                  |                 | Orchestra                      |                     |               |                  |                 |
| Boxing                         |                     |               |                  |                 | Dramatics                      |                     |               |                  |                 |
| Billiards                      |                     |               |                  |                 | Glee Club                      |                     |               |                  |                 |
| Pool                           |                     |               |                  |                 | Archery                        |                     |               |                  |                 |
| Table Tennis                   |                     |               |                  |                 | Handball                       |                     |               |                  |                 |
| Wrestling                      |                     |               |                  |                 |                                |                     |               |                  |                 |

State any experience you may have had in entertaining or handling recreation program activities \_\_\_\_\_

What instruments do you play? \_\_\_\_\_ Yrs. of study \_\_\_\_\_

No. years (High School) \_\_\_\_\_ (College) \_\_\_\_\_

REMARKS: \_\_\_\_\_

Signature \_\_\_\_\_

Fig. 1. — Occupational, educational and recreational interests survey.

physical examination, with pertinent physical findings being noted on the chart. Then the ward medical officer meets with the hospital physical rehabilitation board, which convenes three days a week. The board consists of the medical staff, the welfare and recreation officer and the chaplain, the executive officer acting as chairman. At this meeting each patient is discussed, and an effort is made to fit each one into the program of rehabilitation in a manner which will most rapidly assure his recovery and return to duty. The patient's questionnaire is reviewed and his physical disability evaluated, and finally a schedule of therapy is made out for him (fig. 2).

U. S. NAVAL CONVALESCENT HOSPITAL  
GLENWOOD SPRINGS, COLORADO

WARD.....

PATIENTS' DAILY SCHEDULE

| Name             | Rate  | Diagnosis | Name         | Rate  | Diagnosis |
|------------------|-------|-----------|--------------|-------|-----------|
| 0630 Reveille    | ..... | .....     | 1200 Chow    | ..... | .....     |
| 0700 Breakfast   | ..... | .....     | 1300         | ..... | .....     |
| 0730 Ward Detail | ..... | .....     | 1400         | ..... | .....     |
| 0830 Sick Call   | ..... | .....     | 1500         | ..... | .....     |
| 0900             | ..... | .....     | 1600         | ..... | .....     |
| 1000             | ..... | .....     | 1700 Chow    | ..... | .....     |
| 1100             | ..... | .....     | 1800 Liberty | ..... | .....     |

On Wednesdays and Saturdays liberty will begin at 1300.

.....  
Signature.

Fig. 2. — Patient's daily schedule.

Once the patient is given a schedule of therapy, the outline cannot be altered without approval by the rehabilitation board. This procedure serves to familiarize the entire board with the individual problems which confront it, and in this manner the board is able to check on the therapeutic value of the program and can rapidly evaluate the procedures in use. Patients are required to follow their schedule or lose their liberty hours. In case of acute illness, the ward medical officer endorses an excuse for the patient (fig. 3). Patients as a rule are enthusiastic about entering the program.

U. S. NAVAL CONVALESCENT HOSPITAL  
GLENWOOD SPRINGS, COLORADO

.....Ward.....  
Date  
Name: .....is excused from  
participation in .....  
.....for a period of.....days.  
.....  
Ward Medical Officer.

Fig. 3. — Excuse used in case of acute illness.

The recreational program consists of various athletic activities. We have one large gymnasium. In the winter basket ball, volley ball, badminton, boxing, wrestling, archery, rope skipping, swimming, group calisthenics and ice skating are utilized. In the warmer months golf, touch football, hiking, horseback riding, fishing, hunting and other outdoor sports are added to the list.

The athletic program is under the direction of a trained instructor in physical education, and the medical staff through the physical rehabilitation board serves in an advisory capacity, prescribes the exercise best fitted for aiding the patient's particular disability, due regard being paid to his choice, as noted in his questionnaire.



The swimming program is conducted under the direction of trained swimming instructors. The American Red Cross has cooperated with our program and will issue certificates commensurate with a swimmer's ability; hence an incentive is created. The patient may progress from beginner to intermediate swimmer, swimmer and advanced swimmer certificates. As mentioned, the use of the pool the year round is practicable, since the water supply is from the warm springs.

In work therapy, the patient's desires are considered, and the physical rehabilitation board of the hospital selects, with due regard to the individual patient's choice, that type of work to which he is best suited. In this program we have ward cleaning, yard cleaning, lawn work, laundry work, carpentry, painting, electrical work, plumbing, engineering, auto mechanics, masonry, etc. The patient is assigned to the proper department head, who outlines his work. These procedures are considered essential for the maintenance of the morale of the hospital. We have found that the patients would rather work than be idle.

Certain patients have disabilities which make it impossible for them to participate in some portion of the program, e.g., calisthenics, swimming, other sports or work details. It has been planned for such patients to occupy their time in a corrective type of work in an occupational therapy department.

Owing to the size of the town of Glenwood Springs, there is a lack of suitable entertainment for the patients. Therefore, it seemed logical to include a well rounded program of entertainment in the rehabilitation plan. In the gymnasium at the hospital, movies are shown five nights a week. A dance for patients is held twice a month, and now and then a skit is produced by the patients or the staff. Also, there are card parties, a Happy Hour and a smoker from time to time. All of these serve to pass the long, tedious and boring hours of the convalescent. Also, they promote abstinence from alcoholic beverages and help maintain hospital morale.

The education program is just getting under way, and with the aid of the educational department of the Navy we hope soon to offer many courses which will give high school and college credit. This part of the program will be under the supervision of an officer from the educational department of the Navy. For the present, we are utilizing the services of volunteers from among the patients in several subjects, for example photography, mathematics, current events, auto mechanics and carpentry. It is hoped to enlarge this part of the program as soon as possible, as it has already become popular with the patients.

### Summary and Conclusion

The department of physical medicine and its relation to the United States Naval Convalescent Hospital, Glenwood Springs, Colo., is described. The plan adopted offers a concerted, coordinated effort, so individualized as to accomplish as quickly as possible rehabilitation of the disabled sailor. This goal is attained through the whole-hearted cooperation of the entire staff, under the direction of a far seeing commanding officer and executive officer. The entire program has for its theme the development of a competitive spirit, the spirit to get well.

*(Continued on page 436)*



# EVALUATION OF THE KENNY TREATMENT OF INFANTILE PARALYSIS \*

## Report of Committee

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The formation of the Committee for Investigation of the Kenny Treatment of Poliomyelitis followed a resolution passed by the Section on Orthopedic Surgery of the American Medical Association on June 11, 1942, as follows:<sup>1</sup>

On motion by Dr. Rexford L. Diveley, Kansas City, Mo., it was voted that a committee be formed to study and evaluate the Kenny treatment of infantile paralysis, this committee to be composed of six members, two to be appointed by the chairman of the Orthopedic Section of the American Medical Association, two members to be appointed by the president of the American Academy of Orthopedic Surgeons and two members to be appointed by the president of the American Orthopedic Association, (1) this committee to study and evaluate the Kenny treatment of infantile paralysis, the report to be published either in The Journal of the American Association or the Journal of Bone and Joint Surgery, and the respective members to report to their respective organizations as soon as it is practical and possible.

This committee, in the course of its study, visited a total of six cities and sixteen clinics, some of them being visited two or more times. A total of approximately 740 patients were examined, approximately 650 of whom had been treated by the method advocated by Miss Kenny. Some of these patients represented examples of cases from earlier epidemics, while the majority came from the epidemics occurring since 1940. Early in the investigation questionnaires were sent to over 900 orthopedic surgeons, but no definite conclusions could be drawn from the reports they submitted.

In the examination of these patients we have been cognizant of the fact that epidemics vary tremendously from year to year as to severity, type of paralysis and extent of paralysis. These observations are along the lines emphasized by Wickman<sup>2</sup> in 1907.

One of the things Miss Kenny has stressed in her writings, talks and newspaper articles is the difference of her treatment from what she calls "orthodox" treatment. It is rather difficult to understand what she means by "orthodox" treatment. In this country several different plans of treatment have been followed in the work with poliomyelitis. One might em-

\* Read before the Section on Orthopedic Surgery at the Ninety-fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

<sup>2</sup> Reprinted, J. A. M. A. 125:466 (June 17) 1944.

phasize the fact that years ago Lovett<sup>3</sup> outlined a method of treatment which was followed successfully for many years and is still the basis of most of our modern therapy for poliomyelitis. We quote briefly from articles by Legg<sup>4</sup> and Lovett:<sup>5</sup>

Sensitiveness of the patient should be relieved as soon as possible in order to start muscle training. I have found that hot wet packs and hot baths given two or three times a day for fifteen minutes help best to shorten this stage. Dry heat may be applied, but it is my experience that moist heat is more effective.

Muscle training forms the basis for the modern treatment of poliomyelitis. In theory it consists of an attempt to make the patient send a voluntary impulse to contract a muscle.

Braces should not be used unnecessarily, but they should be used when needed; they are not in any way therapeutic but protective and conservative.

For many years the use of pools has been a prominent phase of the treatment of poliomyelitis. Most of the cases in this country have been treated along the lines advocated by Lovett<sup>3</sup> in 1917.

### The Kenny Concept

Miss Kenny states that her concept of the disease was conceived in the Australian bush over thirty years ago. There has apparently been considerable change in this concept with the passing years. In a book published by Miss Kenny<sup>6</sup> in 1937 there is no mention of "muscle spasm," "mental alienation," "incoordination" or the use of hot wet packs for treatment. She explains this in her preface to the book published by Pohl and Kenny<sup>7</sup> in 1943 as follows: "I was advised by a medical man that to publish these was an unwise procedure. . . . As a matter of fact, I was informed that my liberty would be endangered as a result of such a statement."

During the course given at the University of Minnesota for this committee, Miss Kenny was asked why no mention was made of muscle spasm in her first book. She answered "Dr. Guinane wrote that book for me."

The Kenny concept has been described by Pohl<sup>7</sup> as follows:

This then is the real contribution of Miss Kenny, not a new treatment for the disease of infantile paralysis as it has been conceived in the past but a conception of the disease itself so radically opposed to the old as to almost warrant considering the entity as a new disease. The basic principles of the disease built upon the observations of the behavior of the musculature following an attack of the disease may be stated as follows:

1. The affected muscles are painful, hyperirritable and in spasm.
2. The flaccid muscles are normal. Loss of ability to contract these is due to functional dissociation (alienation) from the nervous system.
3. Ability to voluntarily contract the nonfunctioning muscles returns only after releasing spasm in the opponents and carefully restoring the physiological continuity of the nerve conduction paths back to the muscles.
4. Paralysis due to nerve cell death occurs but it is not a common condition. Most supposed weakness is due to untreated spasm and to disuse in the dissociated muscles.
5. Incoordination of muscle action appears in the untreated case.
6. Deformities do not occur. Those resulting from the old methods were due to untreated muscle spasm.

In short, Miss Kenny's discovery is that infantile paralysis is a disease in which a disturbance of physiologic function of the nervous system is of more importance than actual architectural change. Many of the observable clinical phenomena are the result of functional disorganization of the motor centers and of the nerve pathways to the muscles. The disease affects muscle as well as nerve tissue. Muscle spasm is the primary lesion in the disease rather than paralysis. Miss Kenny has designed a treatment for these conditions. Needless to say, the treatment could have nothing in common with the previous methods, designed for a disease of opposite conception.

The four major points in her concept of the disease have been stressed by Miss Kenny as follows:

1. *Muscle "Spasm."* — Pohl states that this is the primary lesion in the disease and it is claimed to be mainly responsible for the crippling after-effects.<sup>7</sup> This committee believes that while this does exist in the early phases of the disease it usually disappears spontaneously. There may be residual "spasm" which can lead to deformity, but it is by no means the cause of the residual paralysis. While this has been emphasized by Miss Kenny it is not a new discovery, as stiffness, muscle tenderness and early contractures have been long recognized and considered an integral part of the acute phase of this disease.<sup>8</sup>

2. *Mental Alienation.* — Quoting Pohl again, "The flaccid muscles are normal. Loss of ability to contract these is due to functional dissociation (alienation) from the nervous system."<sup>7</sup>

The statement that the flaccid muscles are normal is obviously not true. There are instances in which a functional loss of use may result from pain, and in these instances function is restored as the pain subsides. Functional disuse may also result from stretch in any muscle opposed by muscles in varying degrees of contracture. Mental alienation has been covered in the past by the terms temporary paralysis, stretch paralysis and physiologic dissociation, and these would seem a more satisfactory scientific explanation than simple "functional dissociation from the nervous system." It is thus evident that this condition which they term "mental alienation" is not a new discovery, having been well described in 1911 by Robert Jones.<sup>9</sup>

3. *Incoordination.* — Pohl states: "Incoordination of muscle action appears in the untreated cases."<sup>7</sup> It is our impression that this is merely another term for the condition of muscle substitution or mass muscle action of an extremity, long recognized by orthopedic surgeons. As a matter of fact the term "muscle incoordination" was used by Wilbur<sup>10</sup> to describe this condition in poliomyelitis as early as 1912. This question is of academic interest and of relatively little importance.

4. *Paralysis* (denervation now preferred by Miss Kenny). — Pohl states: "Paralysis due to nerve cell death occurs but is not a common condition. Most supposed weakness is due to untreated spasm and to disuse in the dissociated muscles."<sup>7</sup>

It is our belief that if deformities are prevented the flaccid paralysis caused by destruction of nerve cells is the most important cause of crippling.

### Treatment

In the latest textbook by Pohl and Kenny<sup>7</sup> we find the following:

While the main object of treatment in the acute stage is that of the relief of muscle spasm by means of the application of hot foment, yet the attempt to restore the physiological continuity of the nerve pathways back to the muscles must engage the attention at the earliest possible moment.

From our observations the Kenny treatment may be said to consist of the following:

1. Active treatment, including muscle reeducation, is begun as early as possible.

2. The patient is maintained in the normal standing position in bed.

3. "Spasm" and pain are treated by the use of hot foment. These are applied and reapplied continuously for about twelve hours per day according to a rigid technic. These are continued until "spasm" is relieved.

4. The extremities are carried through as wide a range of movement as can be tolerated several times each day.

5. Muscle reeducation is begun as early as possible. This is directed toward (a) "the restoration of mental awareness of muscles." (b) "restor-

ation of coordination or combating of incoordination" and (c) "restoration of muscle function."

6. No splints or braces are tolerated.
7. The respirator should not be used on any patient.
8. Patients and their families are encouraged to believe that complete recovery will ensue or, in the event of residual paralysis, that the Kenny treatment was not instituted early enough or had been improperly administered.
9. All improvement is attributed to the treatment, and no spontaneous recovery or improvement is recognized.

10. Balneotherapy is an important adjunct to the foregoing procedures.

From personal observations of this committee during the past two years, each of these ten points can be analyzed and discussed as follows:

1. The institution of treatment directed toward the involved muscles as early as possible is desirable, but the general condition of the patient during the acute febrile stage may be such the handling necessitated by the Kenny treatment can be detrimental. In other words, therapy during the acute febrile stage is primarily a medical problem.

2. Proper positioning in bed by one means or another has been a standard practice among physicians for over thirty years to our knowledge.<sup>11</sup> It is still a recommended procedure.

3. Heat in some form, including hot foment, has been used by physicians for many years to combat pain in infantile paralysis. In most instances the pain can be relieved by the use of hot foment. We have seen a few cases, however, in which relief was not afforded by their use. It is the impression of this committee that pain is not an important feature of the disease in most instances and, when present, can be relieved also by other measures. Recovery from "spasm" in most instances takes place spontaneously. Hot packs may relieve this "spasm," but so will adequate rest. Therapy directed at pain and "spasm" should be discontinued as soon as these symptoms subside. We have seen instances in which hot packs seem to increase and prolong the "spasm." In some, "spasm" was relieved after the packs were discontinued. In others, "spasm" which had been relieved recurred when the packs were discontinued and was again relieved by their reapplication. The use of hot foment therefore cannot be considered as a panacea in this disease and their use must be guided by good medical judgment. The rigid technic insisted on by Miss Kenny in the application of these packs is neither important nor essential.

4. So long as active and passive movement of these extremities is carried out within the range of comfort, this point is acceptable. This procedure has been recommended by many physicians in the past, but again we stress the point that this movement should not be forced beyond the point of pain.

5. Jones and Lovett<sup>12</sup> described and used a method of muscle reeducation which in principle is similar to the method taught by Miss Kenny. This has served as the basis for orthopedic treatment for many years.

6. Cases have been seen under Kenny treatment in which early contractures were developing, and by application of plaster splints these contractures were controlled after their correction. This committee believes that splints are beneficial for some patients.

Braces should form an important part of the treatment during the later stages of this disease. We have seen Kenny treated patients walking with two English style crutches who could be so benefited by braces that the crutches could be discarded, thus liberating the hands for other use.

7. Respirators have saved many lives and should be used for patients with sufficient paralysis to embarrass respirations.

8. There is no evidence that the Kenny treatment prevents or decreases the amount of paralysis. We criticize severely the oft repeated statement of Miss Kenny to patients who have come to her after treatment elsewhere that had this case come to her early the disability would have been prevented. Such statements are not founded on facts.

9. Spontaneous recovery in poliomyelitis occurs in many cases. Reports in the medical literature indicate that this varies in different epidemics from 50 to 80 per cent. We have seen many patients receiving Kenny treatment who showed no muscle involvement at any time, yet she assumes the credit for their satisfactory results and does not take into account the factor of spontaneous recovery.

10. Pools and baths have long been used in the treatment of poliomyelitis.

### Comment

1. Miss Kenny's objection to muscle examination and hence the lack of accurate records is to be condemned. If this should be followed by all clinics no reasonably accurate statistics would be available nor could the results from any type of treatment be determined. We do not feel that muscle examinations, if carefully and judiciously conducted, are of harm to the patient. We found no one in our visits to various clinics, other than Miss Kenny, who felt that careful muscle examinations were detrimental.

2. Miss Kenny has repeatedly stated that under "orthodox" treatment only 13 per cent of the patients recovered without paralysis,<sup>13</sup> while under her treatment over 80 per cent recover. We believe that this is a deliberate misrepresentation of the facts of treatment by other methods. This we attribute to her overzealous desire to promote further the adoption of the Kenny treatment. Miss Kenny's statement of 80 per cent recovery under her treatment has not been supported by accurate statistics in a significant number of cases. The figure on "orthodox" treatment is taken from an article which dealt entirely with severely paralyzed patients. Miss Kenny has been told repeatedly that this is not a fair comparison to make and that, if every case in an epidemic is included in the statistics, recovery of from 70 to 90 per cent can be expected from "orthodox" treatment.<sup>14</sup> Miss Kenny made this inaccurate comparison as late as May, 1944.

3. Some of the people using the Kenny treatment believe that paralysis can be prevented when treatment is started early enough; that is, prior to the onset of paralysis. We have seen enough cases, however, in which the Kenny treatment was instituted very early to be convinced that this does not prevent or even minimize the degree of permanent paralysis.

4. In several cases seen by us the paralysis progressed after the Kenny treatment was instituted.

5. The amount of residual paralysis in any case is dependent on the amount of destruction in the central nervous system if deformities are prevented, and this varies tremendously in different epidemics.

6. There may be some local changes in isolated muscles during the acute stage the nature of which must be studied further. This change, if present, may be primary in the muscles themselves or may be secondary to changes in the central nervous system. As was emphasized by Lovett, contractures may develop early and, if not prevented or corrected during the early stages, may cause crippling and be resistant to treatment. It must



be emphasized that the prevention of these contractures is the primary means by which medical care is able to minimize the effects of the disease.

7. In the opinion of the committee, after observation of 740 cases, particularly those during the epidemic of 1943, the continuous hot packs for all patients with minimal evidence of "spasm" is of questionable value and an unnecessary waste of manpower and hospital beds. Several clinics were using prone packs with good effect. The simplicity of their application requires much less manipulation of the patient. Once again we emphasize the fact that good medical judgment should be exercised in determining the cases in which hospital treatment should be instituted or continued.

8. Miss Kenny has laid claim recently to a new and revolutionary discovery by means of which she can diagnose the disease and determine the involved extremities prior to the onset of the usually recognized diagnostic clinical signs. She also claims that the institution of her treatment at this time will control the pain and prevent paralysis. She has stated that this is her greatest single contribution.

The preparalytic diagnosis of poliomyelitis has been described by Draper<sup>15</sup> and by Aycock and Luther.<sup>16</sup> There has been no satisfactory evidence presented to this committee that the institution of early local treatment will alter the course or the extent of the paralysis in any case.

9. Many of those who have used the Kenny method of treatment have repeatedly stated that all paralytic scoliosis can be prevented by this program of care. Among the patients studied by this committee from the last three epidemics, no severe scolioses and only a few slight curvatures of the spine have been noted. However, severe paralytic scoliosis occur only in growing children and is uncommon within less than three years after the onset of the disease. Several more years must elapse before any final conclusions can be reached with regard to the amelioration or prevention of paralytic scoliosis by means of the Kenny treatment.

10. While the committee disapproves of and condemns the wide publicity which has misled the public and many members of the medical profession, it acknowledges that this has stimulated the medical profession to reevaluate known methods of treatment of this disease and to treat it more effectively.

11. During this investigation the committee has received the greatest courtesy and cooperation from the various clinics it has visited. We take this opportunity to express our sincere thanks to these people who have expended much time and effort in the presentation of their cases. We believe that these various clinics have made a sincere effort to carry out the treatment in the most effective way.

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# ARCHIVES of PHYSICAL THERAPY

OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL THERAPY

## .. EDITORIALS ..

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### DIAGNOSIS IN PHYSICAL MEDICINE

The diagnostic aspects of physical medicine are frequently overlooked by the members of the medical profession including specialists in this field. Investigative studies have largely dealt with the technical aspects of physical therapy. Textbooks of physical medicine and educational curricula also place little emphasis on the use of physical agents in diagnosis. Successful scientific treatment must be based on correct diagnosis, however. It is therefore of great importance in physical therapy, in order that it may not deteriorate into empirical routine, that due consideration be given to problems involving differential diagnosis and the special physical methods of diagnosis which have been developed.

The use of electrical currents to determine the state of electrical excitability of nerve and muscle is the foremost example of diagnostic physical medicine. The galvanic, faradic and sinusoidal currents of suitable frequency are used in cases of peripheral nerve injuries to test for the reaction of degeneration of Erb, and in experienced hands valuable qualitative information can be obtained by this method. Chronaxie determination and plotting the full strength-duration curve of threshold excitability yields quantitative information as to the state of muscle innervation. This is of great wartime significance for early indication of neural regeneration or its absence is of great aid in the treatment of peripheral nerve injuries. In denervated muscle the alteration of its ability to accommodate to currents of slowly rising change of potential may also be used as a sensitive indicator of the degree of muscle innervation. Stimulation in this instance may be with progressive currents as described by Pollock and his collaborators.<sup>1</sup> The multiple frequency sine-wave generator developed by Osborne et al.<sup>2</sup> gives us another sensitive method of quantitating liminal responses of muscle to currents of measured strength and frequency. This apparatus in addition to its diagnostic applications, may be used to determine the optimum frequency for stimulating denervated muscle therapeutically.

Another electrical characteristic of muscle is the discharge of minute action potentials. These may be recorded by powerful electronic amplifiers in the form of electromyograms. Although in the past such studies have been done chiefly in physiologic laboratories, clinical applications in the field of electrodiagnosis have been demonstrated.<sup>3</sup> The appearance of spontaneous discharges of a pattern suggesting motor unit activity has been used as an early evidence of nerve regeneration and muscle innervation which is of diagnostic and prognostic value. These electrical studies are also of value in differentiating types of muscular atrophy such as in muscular dystrophy, progressive muscular atrophy, amyotrophic lateral sclerosis, poliomyelitis and peripheral neuritis.

Measurement of electrical skin resistance constitutes another physical diagnostic tool which has been found useful as an objective test of anesthetic areas in peripheral nerve lesions.<sup>4</sup> Its particular value lies in the fact that the active cooperation of the patient is not required. This fact gives it an

application in determining the presence of hysterical anesthetics. Muscle stimulating currents are, of course, also of great value in proving hysterical paralyses. Consequently the physician in physical medicine frequently renders service in the diagnosis and treatment of hysteria.

Ultraviolet lamps are also physical therapeutic devices which have diagnostic usefulness. Radiations of these wavelengths are used in dermatology to test for fluorescence.<sup>5</sup> In some cutaneous lesions photosensitivity studies are necessary to determine correct diagnosis. They also have a role in questionable disseminated lupus erythematosus.

Numerically rheumatoid arthritis, degenerative joint disease and other allied conditions form the bulk of disorders requiring physical therapy in a general hospital department. It is here that treatment is apt to be applied more or less empirically without due regard to the exact nature of the condition under treatment or the natural spontaneous course of the symptoms. If each patient is carefully examined and keenly observed during therapy the physical therapy physician may develop diagnostic acumen which may make his services sought for this purpose alone. He will at the same time gain insight as to the most effective therapy and the optimum duration of its application. In physical medicine one is also in the unique position of being able to evaluate impartially the relative benefits of surgical and conservative treatment in problematical conditions such as backache of various etiologies, particularly ruptured nucleus pulposus. Other problems for the specialist in physical medicine include quantitation of muscular defects in flaccid and spastic paralyses.

These examples of the role of diagnosis in physical medicine by no means exhaust the possibilities, for there are applications in all the medical and surgical specialties. It seems of special significance at this time to emphasize the broad aspects of physical medicine in diagnosis as well as treatment, in order that this specialty may show suitable scientific progress and attract talented physicians to its ranks.

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### ATTEND THE CONVENTION

To My Fellow Members of the American Congress of Physical Therapy—When we last met in convention, September 1943, in Chicago, we were thrilled by the news of Italy's surrender. During the past year, we have made great progress in the war, and we can begin to see the end. We are all proud of the tremendous development of war medicine. One of the outstanding contributions has been the dominant feature of physical medicine in rehabilitation, reconditioning and convalescence.

Much of this work has been contributed by our colleagues, who were civilians only a few years ago. War medicine is, therefore, a mirror reflecting civilian medicine. It now becomes our duty to study, evaluate and adopt much of the experience from the armed services. This can only be done by getting together for formal and informal discussions in convention of the various specialties.

We are all familiar with former conventions of the Congress, where Coulter lead the Rotarians, Kobak excelled in oratory, Hollander represented the silent forces, Ewerhart spoke of physical fitness, Palmer represented the easy South and Hibben the hospitable West, Moor stood for scientific integrity and Titus for fun in life, Kovacs developed brotherly love, Bierman spoke on academic training, McClellan on the advantage of water and McGuinness on medical economics, Martucci emphasized tonsorial perfection and Schmidt professional dignity, while Zeiter and Marion Smith did all the work, and quarter back Krusen called the plays.

It is time to add new faces and new brains in the procedures of the convention. We have many able men and women in the Congress who can add their knowledge and experience to the common cause.

Enormous forces are let loose in physical medicine today. They must be harnessed and guided into properly controlled channels. I know of no previous convention that was more important in its bearing on the future of our profession. I, therefore, take this opportunity to urge all of you to make your plans for attending the convention in Cleveland in September. The program is an interesting one and should appeal to all of you in the armed services as well as you who labor in civilian practice.

KRISTIAN G. HANSSON, M.D., President,  
American Congress of Physical Therapy.

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#### A REMINDER

Only a few weeks remain until the meeting of the Congress of Physical Therapy in Cleveland, September 6 to 9. Therefore, it is important to remind those who are interested in the course of instruction to make application in the near future.

Every effort has been made to carry out plans to have a course in which the lectures and demonstrations would be concerned with known basic factors involved in the use of some of the physical agents and to have discussions relative to problems important to the Army and Navy hospitals.



# MEDICAL NEWS

## Greetings from Dr. P. Bauwens

On May 25th the Congress offices received a note from Dr. Bauwens in which he referred to to his Congress membership card as "this link with the friends I made while in the United States of America means more than ever to me and I would like you to extend the expressions of my gratitude to the officers of the Congress for their mark of cordiality."

## Captain Pruze Talks on Physical Therapy

During June a medical staff conference was held in the U. S. Naval Hospital, Charleston Navy Yard. The subject for discussion was "The Uses of Physical Therapy in a Naval Hospital," by Commander A. P. McGinty, (MC), U. S. N. R. Captain Arthur M. Pruze, M.C., U. S. A., as a guest speaker, spoke on the subject of "Physical Therapy and Peripheral Nerve Injuries."

## Dr. Toomey Director of Review Course on Poliomyelitis

During the months of May, June and July a review course on treatment of poliomyelitis in the early stage of the disease has been conducted at the City Hospital, Cleveland, under the auspices of the Cuyahoga County Chapter of the National Foundation for Infantile Paralysis, Inc. Dr. John A. Toomey, Professor, Clinical Pediatrics and Contagious Diseases, School of Medicine, Western Reserve University has directed the work. The program for July is as follows:

July 5 — Chairman, James A. Dickson, M.D., Orthopedic Surgeon, The Cleveland Clinic. Pros and Cons for Underwater Exercises. Electrical Stimulation and Manipulation, Miss Hilda Case, Chief, Department of Physical Therapy, University Hospitals, Cleveland. Criterion of Recovery in Poliomyelitis, John A. Toomey. When Should a Poliomyelitis Patient Be Splinted? Clarence H. Heyman, M.D., Assistant Clinical Professor of Orthopedic Surgery, School of Medicine, Western Reserve University.

July 12 — Chairman, C. Glenn Barber, M.D., Orthopedic Surgeon, St. Vincent's Charity Hospital, Cleveland. Recent Advances in the Physiology of Muscles, Herman Kabat, M.D., Lieut. Comdr., U. S. Navy; Associate Professor of Physiology, University of Minnesota. The Present Status of Experimental Work in Poliomyelitis. Albert B. Sabin, M.D., Major, U. S. A.; Associate Professor of Pediatrics, University of Cincinnati, Cincinnati.

July 17 — Chairman, Clarence H. Heyman, M.D. Analysis of Case Reports and Results of Treatment in the Recent Literature. John A.

Toomey, M.D. Resume on the Treatment of Infantile Paralysis. A. Bruce Gill, M.D., Professor, Orthopedic Surgery, School of Medicine, University of Pennsylvania and Professor of Orthopedics, Jefferson Medical College, Philadelphia.

## Permanent Rank for Physical Therapy Technicians

The President of the United States has just signed Public Law 350, Seventy-eighth Congress which gives to nurses, female dietitians and physical therapy technicians a commission in the Army of the United States for the duration and six months thereafter. This law authorizes actual rank in place of relative rank.

## Physical Therapy at Mayo General Hospital

The physical therapy department of Mayo General Hospital, Galesburg, Illinois, entered its sixth month of operation under the direction of Captain Albert O. Singleton, Jr., of Galveston, Texas.

Opened in February of this year, the physical therapy department here began slowly due to the small number of patients at the new army hospital, increasing steadily the number of treatments given until the total amount for May was 3,743. The number of treatments for June, according to Captain Singleton, will almost double that of May, having reached already as of June 24 a total of 4,581.

Physical Therapy equipment at Mayo is of the most modern available, including a whirlpool room of seven baths, a massage and infra-red room, hydrotherapy room, ultraviolet lamps, scotch douche and diathermy.

Commanding officer at Mayo General Hospital is Colonel Henry L. Krafft.

Captain Singleton, who entered the Army in September, 1942, received his medical degree at the University of Texas, interned later at the University of Pennsylvania. He was previously assigned at station hospitals of Camp Grant, Illinois and Camp McCoy, Wisconsin.

## New Grants Announced by National Foundation

Twenty-seven grants, totaling \$1,128,770, have been made by The National Foundation for Infantile Paralysis to leading universities, laboratories and other organizations to strengthen and broaden the Foundation's fight against infantile paralysis. These grants, recommended by medical advisory committees of the Foundation at their semiannual meeting on May 15 and 16 and later approved by the board of trustees, were in operation by July 1, giving full opportunity to



scientists to study the disease during the summer increase.

Prominent among the grants were three to cover five year programs. Two of these, totaling \$495,000, provided for the establishment of "Units for Research in Physiology as Related to Physical Medicine." The larger of these units, with a grant of \$320,000 is at the Medical School of the University of Minnesota. It was at this university that the original tests of the Kenny method took place, financed by the National Foundation, which has maintained a Kenny training center there ever since. Under a grant for \$175,000, the other unit has been established at Northwestern University Medical School, which was one of the first institutions to adopt a department of physical medicine and to encourage research in this specialty. This university, where the National Foundation has financed another Kenny training center, has expanded its program of scientific investigation and training of investigators and teachers in the field of physical medicine.

The third long term grant of \$325,000, was made to the University of Michigan School of Public Health for expansion and operation of a virus study unit. This unit represents a direct attack on the cause of the disease, since it provides both for virus research and for the training of virologists. Special emphasis is being given to the development of a quick, inexpensive and practical method of identifying the poliomyelitis virus. Such a method would greatly forward epidemiologic studies of the disease, as well as make possible fast, positive diagnoses.

#### University of Minnesota Grant

The work at the University of Minnesota comprises research and study designed to throw new light on the physiologic problems encountered and the clinical application of physical methods both to poliomyelitis and to other diseases. The problems involved call for coordinated activities in neurophysiology and other branches of physiology, biochemistry, pharmacology, neuropathology, neuro-anatomy, clinical neurology, pediatrics, orthopedics and physical therapy. Direction of the investigation is in charge of a committee consisting of the heads of the departments concerned, with Dr. Maurice B. Visscher, head of the department of physiology, as chairman.

#### Northwestern University Grant

Under the grant to Northwestern University Medical School, research is being carried out on the use in diagnosis and treatment of electricity, light, heat, cold, exercise, rest and other physical measures. The effects of these forces on nerves and muscles damaged by diseases such as infantile paralysis make up a major part of the study. Many of the projects included have been in operation for the past several years with the aid of the National Foundation. It seemed advisable to the university to enlarge the scope of the program by including all departments concerned on a cooperative basis, thus making possible many lines of investigation which otherwise could not

be undertaken. Direction of the unit is under Dr. A. C. Ivy, chairman of the department of physiology.

#### University of Michigan Grant

The work at the University of Michigan includes a well rounded program of field and laboratory investigation of poliomyelitis and other virus diseases with research on how such diseases established in a community and the manner in which they spread, the maintenance of a virus laboratory particularly adapted to use by clinicians and the teaching and training of personnel for investigation of viruses and virus diseases. The enlarged unit is under the direction of Dr. Thomas Francis, Jr., professor of epidemiology.

A complete list of the grants is as follows:

|  |                |
|--|----------------|
| In the Field of After-Effects —                  |                |
| University of Minnesota, Minneapolis.....        | \$ 320,000.00  |
| Northwestern University Medical School, Chgo.    | 175,000.00     |
| University of Rochester School of Medicine and   |                |
| Dentistry, Rochester, N. Y.....                  | 18,000.00      |
| *Children's Hospital, Boston.....                | 11,900.00      |
| University of California Medical School, San     |                |
| Francisco.....                                   | 6,500.00       |
| Massachusetts General Hospital, Boston.....      | 3,600.00       |
| Marquette University School of Medicine, Mil-    |                |
| waukee.....                                      | 1,500.00       |
| After-Effects total.....                         | \$ 536,500.00  |
| In the Field of Virus Research —                 |                |
| University of Michigan School of Public Health,  |                |
| Ann Arbor.....                                   | \$ 325,000.00  |
| Michigan Department of Health, Lansing.....      | 23,360.00      |
| University of Wisconsin, Madison.....            | 10,400.00      |
| New York University College of Medicine, N. Y.   | 9,180.00       |
| Wayne University College of Medicine, Detroit..  | 9,010.00       |
| Stanford University, California.....             | 8,000.00       |
| University of Minnesota, Minneapolis.....        | 2,450.00       |
| Virus research total.....                        | \$ 392,400.00  |
| In the Field of Education —                      |                |
| Fellowships for Health Education.....            | \$ 50,000.00   |
| Georgia Warm Springs Foundation, Warm            |                |
| Springs, Va.....                                 | 44,620.00      |
| *National Organization for Public Health Nurs-   |                |
| ing, New York.....                               | 36,150.00      |
| National League of Nursing Education, N. Y.....  | 19,000.00      |
| The Cleveland Rehabilitation Center, Cleveland.. | 13,600.00      |
| The American Physiotherapy Association, Palo     |                |
| Alto, Calif.....                                 | 15,000.00      |
| Harvard Infantile Paralysis Commission, Boston.. | 10,000.00      |
| D. T. Watson School of Physical Therapy,         |                |
| Leetsdale, Pa.....                               | 4,500.00       |
| University of California School of Physical      |                |
| Therapy, San Francisco.....                      | 4,000.00       |
| Northwestern University Medical School, Chicago  | 3,000.00       |
| Education total.....                             | \$ 199,870.00  |
| Grand Total.....                                 | \$1,128,770.00 |
| * Two Grants.                                    |                |

#### Fellowships for Health Education

To provide men and women professionally trained in public health work who will aid the nation's army of polio fighters, The National Foundation for Infantile Paralysis has set aside the sum of \$50,000 for fellowships in health education.

Under this program, which has been developed in cooperation with the U. S. Public Health Service, qualified men of certain Selective Service classifications, as well as qualified women, will go into training starting this fall.

In cooperating with the National Foundation, Surgeon General Thomas Parran, of the U. S. Public Health Service said: "The success of well-

planned state and local health education programs has amply demonstrated the value of trained personnel having a thorough knowledge of both public health and education. In recent years, the rapid expansion of health education throughout the nation has created a demand for qualified workers that far outstrips the available supply."

Candidates for health education fellowships will be selected by an advisory committee of the U. S. Public Health Service, and those accepted will be assigned to schools of public health at Yale University, the University of Michigan and the University of North Carolina.

A Bachelor of Science degree, or its equivalent from a recognized college or university, is an essential qualification for one of these fellowships leading to the Master of Science degree in public health. This postgraduate training will consist of nine months' academic work, followed by three months of supervised field experience.

Women between the ages of nineteen and forty who have the above educational qualifications and who are citizens of the United States are eligible. Men who are United States citizens over thirty years of age also may apply, and the War Manpower Commission has declared Selective Service registrants in 4F and 1AL classifications as eligible for health education fellowships.

A fellowship in health education covers a stipend to the trainee of \$100 monthly for twelve months; tuition and university fees to the school; and expenses for field service. Applications are obtainable from the Office of the Surgeon General, U. S. Public Health Service, Washington (14), D. C. Applications must be accompanied by a transcript of college credits and a small photograph, and must be in the Office of the Surgeon General not later than August 15, 1944.

### Standardization of Bibliographic References

*To the Editor:* You have frequently been the recipient of many excellent suggestions intended for general improvement of the medical and allied professions. Recently the recommendation to advocate universal adoption of the metric system in lieu of the apothecary system was given prominence and justifiably so. Can you listen to another?

All too frequently authors of proposed publications in the medical sciences are confronted with varying whims and idiosyncracies of editorial board members in relation not only to structure, content and style of presentation but in particular to one feature of a manuscript which should by all measures of practicability and convenience be uniform, namely the bibliographic notations. Your organization has made a real contribution in the direction of standardization in this situation, but spasmodic or rhythmic reference must apparently be indulged in until our editorial boards eventually see the "wisdom of (your) ways" and follow suit.

If one chooses to note a certain reference one would have to arrange the content in varying manner, the form utilized depending on the medium of publication employed. Recently a perusal of ten journals appearing alphabetically on our library reference

shelf presented the following potential variations of a reference chosen at random:

1. Tuckwiler, A. P.: *Am. J. Med. Sc.* **184**, 473, 1932 (no title) (*American Journal of the Medical Sciences*).
2. Tuckwiler, P. A.: Title, *Am. J. Med. Sc.*, **184**, 473, 1932 (*American Journal of Tropical Medicine*).
3. Tuckwiler, P. A.: Title, *Am. J. M. Sc.* **184**:473 (Aug.) 1932 (*THE JOURNAL*).
4. Tuckwiler, P. A.: Title, *Am. J. M. Sc.*, 1932, 184, 473 (*American Review of Tuberculosis*).
5. Tuckwiler, P. A.: 1932 Title, *Am. J. Med. Sc.*, vol. 184, pp. 473. (*Anatomical Record*).
6. Tuckwiler, P. A.: Title, *Am. J. Med. Sc.* **184**:473 (Aug.) 1932 (*Anesthesiology*).
7. Tuckwiler, P. A.: Title, *Am. Jr. Med. Sc.* 1932, clxxxiv, 473 (*Annals of Internal Medicine*).
8. Tuckwiler, P. A.: Title, *Am. J. Med. Sc.* 184:473 (Aug.) 1932 (*Annals of Otolaryngology, Rhinology and Laryngology*).
9. Tuckwiler, P. A.: Title, *Am. Jour. Med. Sc.* **184**, 473, August, 1932 (*Annals of Surgery*).
10. Tuckwiler, P. A. *Am. J. Med. Sci.* **184**, 473 (1932) (*Archives of Biochemistry*).

Note that the only true uniformity concerns the position of the author's name. Most journals follow the author with a colon; two in this group use the period. Some prefer titles others do not. The date of publication is placed first by some, last by others, and one even specifies parenthetical enclosure. The month of publication is mandatory in some journals but deleted in others. Roman numerals are still utilized (7) for volume designation but fortuitously not too frequently. Abbreviations concerning the journal cited are surprisingly consistent, but even here some must be individualistic and stray aberrantly by using *Sci.* instead *Sc.* (10), *Jr.* (7) and *Jour.* (9) instead of *J.* The closest approximation to similarity is between numbers 3, 6 and 8, but note that even in 6 the pages covered by the article are specified, e. g. 473-4?? etc. and 8 employs the comma after the parentheses.

Enough to prove the point; to have peregrinated further would not only have been discouraging but probably nauseating as well. Must some editorial boards still insist on utilizing the same pattern only because a change or break in consistency is traditionally resisted? Can there be better reasons? Why not all conform to *THE JOURNAL* and *Quarterly Index* pattern, to which many editors now conform? Standardization in this situation would be generally appreciated.

FREDERICK F. YONKMAN, M.D., Detroit,  
Professor of Pharmacology and Therapeutics,  
Wayne University College of Medicine  
[*J. A. M. A.* **124**:527 (Feb. 19) 1944.]

### Office of Rehabilitation Established at the Bureau of Medicine and Surgery

The Navy Department recently announced that the Surgeon General has authorized the establishment of an Office of Rehabilitation in the Bureau of Medicine and Surgery. This office will develop, place in operation and direct the program of rehabilitation for the Medical Department of the U. S.

Rehabilitation, as it relates to this program, shall be interpreted as meaning all activities and services which may be required to supplement the ordinary or usual therapeutic procedures in order to achieve maximum adjustment of the individual patient either for further military serv-

ices, or for return to civil life with the least possible handicap from his disability. The Office of Rehabilitation shall serve in an advisory capacity in suggesting such procedures as may be required to shorten the convalescent period and contribute to the rehabilitation of the patient.

### **David B. Cropp Crops Up Again Post Office Department Detects Old Fraud Under New Name**

For many years David B. Cropp of New York has been in and out of a fraudulent "height increasing" scheme perpetrated through the mails. It began apparently with "The Pandiculator," one of the earliest of the alleged spine-stretching devices. This one was advertised in pulp periodicals at least as far back as 1914.

In April, 1942, an additional fraud order was issued against H. C. Crowell alone, after the Post Office discovered that he had simply remained in the business and run it under his own name instead of that of the Pandiculator Company. Meantime, it appears, Cropp had reentered the business or started a competing one, operating under the trade style "International Health Device Corporation" and calling his product "The Therapeutic Couch" or "The Cropp Therapeutic Couch." The description of it seems to correspond to that of the Pandiculator. Reportedly Cropp used testimonials from laymen, osteopaths, chiropractors and physiotherapists as to the efficacy of the couch in treating many serious disorders, besides increasing height and reducing weight and waistline measurements. This enterprise also came to grief when a Post Office fraud order was issued in October, 1942, against the names David Cropp, David B. Cropp and the International Health Device Corporation.

When Cropp was ordered by the Post Office Department to show cause why his Physical Improvement, Inc., should not be debarred from the mails on grounds of fraud, he presented as a witness in his behalf a naturopath licensed as such in Connecticut, Florida and the District of Columbia, and as a physiotherapist in New York state. After hearing all the evidence, the Post Office Department found that Physical Improvement, Inc., not only was a continuation of Cropp's previous fraud, and an attempt to evade the fraud order issued against Cropp and the International Health Device Corporation, but was in itself a swindle. Accordingly, a new fraud order was issued on Aug. 7, 1943, against Cropp and his latest trade designation, Physical Improvement, Inc.

Note the finding of the Post Office Department that even before the fraud order against Cropp's

International Health Device Corporation had been issued (although expected) Cropp had already incorporated his latest enterprise, Physical Improvement, Inc., thus showing his determination to continue the swindle, and that in this move he was assisted by a Jay H. Radley, M.D. The only person of this name in the American Medical Directory is listed under New York City. According to the data, he was born in 1863, was graduated from the old College of Physicians and Surgeons, Chicago, in 1889 and licensed to practice medicine in thirteen states. In 1929 one of the government departments at Washington, after looking into an advertised "obesity cure," reported that some of its promotional literature referred to Dr. J. H. Radley of New York as a recognized authority on skin diseases and featural defects. It has also been reported that J. H. Radley once authored an article in a chiropractic journal and that after his name were the letters "M.D., D.C.," the "D.C." presumably standing for "Doctor of Chiropractic."

The previous fraud orders issued against the various names under which this brazen scheme was perpetrated were dealt with at considerable length in this department of *The Journal* for April 4, 1942, page 1240; Dec. 12, 1942, page 1243, and Feb. 19, 1943, page 537. Apparently this swindle is hard to scotch. There seems to be something appealing in the idea that one may grow tall and strong and beautiful just by lying down on a special kind of couch! When will Cropp crop up again? — [*J. A. M. A.* 124:1152 (April 15) 1944.]

### **International College of Surgeons**

The Ninth Annual Assembly of the International College of Surgeons will be held on October 3, 4, 5, 1944 at the Benjamin Franklin Hotel in Philadelphia, Pa. The program will be devoted to war, rehabilitation and civilian surgery.

This Assembly, sponsored by the United States Chapter of which Thomas A. Shallow, M.D., F.A.C.S., F.I.C.S., of Philadelphia is President, has set up its Arrangement Committee with Dr. Rudolph Jaeger as General Chairman. Dr. Jaeger will be inducted as the incoming President of the United States Chapter at the Convocation on Wednesday evening, October 4.

### **Emory W. Carr**

It is with regret that we announce the death of Dr. Emory W. Carr at Lyons, New York. Dr. Carr was a member of the Congress for a number of years. We extend our deepest sympathy to the family of Dr. Carr.



## BOOK REVIEWS

**PHYSICAL MEDICINE IN GENERAL PRACTICE.** By *William Bierman*, M.D., Attending Physical Therapist, Mount Sinai Hospital, Assistant Clinical Professor of Therapeutics, New York University Medical College, New York. Cloth. Price, \$7.50. Pp. 654 with 310 illustrations. New York: Paul B. Hoeber, Inc., 1944.

Physical medicine and physical therapy are synonymous terms, according to the author. The former is the more modern terminology, which was introduced in England and has come into common use here. This book is written by a leader in the field of physical medicine. Bierman is in charge of the Department of Physical Medicine at the New York University Medical College which received the largest grant, \$400,000, from the Baruch Committee on Physical Medicine and it is fitting that the book is dedicated to Bernard M. Baruch. This book tells the general practitioner and those in special fields how to use physical agents. Historical references and extensive descriptions of the physics of light, heat and electricity are omitted but the technics of the application of physical measures and their physiologic rationale are emphasized. Reference is also made to important subjects of physical medicine which are beyond the scope of the general practitioner (because of their intricacy, space requirements, cost, etc.) in order that the general practitioner may become aware of them even though he cannot utilize them himself. Bierman emphasizes that physical medicine has its limitations and also has the potentiality for doing harm. In an excellent chapter, "Conduct of Treatments" references are given to pitfalls which should be avoided. This chapter serves as an introduction to the clinical application of physical medicine. This is a good general textbook which adequately presents the essentials of physical medicine. The literary style makes it easily readable. It should be in the library of every general practitioner.

**PSYCHIATRY IN WAR.** By *Emilio Mira*, M.D., formerly professor of Psychiatry at the University of Barcelona, Lecturer in Psychotherapy and Medical Psychology at the University of Buenos Aires. Cloth. Pp. 206 with 6 illustrations and an appendix. Price, \$2.75. New York: W. W. Norton and Company, Inc., 1943.

The content of this book is based largely on the experiences of the author during the recent war in Spain. It should be of interest to any physician in military service. Practical observations are made on problems that occur commonly in military service and sufficient theory is included to provide a background. Fear and anger are analyzed; psychiatry in Franco's and the Spanish Republican armies is discussed and

specific disorders, psychiatric rehabilitation, morale and general mental hygiene are considered briefly. In the appendix a system of myokinetic psychodiagnostics is fully described. The application to various problems is explained in the text. Such a procedure may have interesting possibilities in the solving of the problems in our own armed services. The outstanding contribution of this work seems to be that it provides the medical officer on active duty practical aid in understanding and solving the numerous psychiatric problems with which he is confronted.

**BACKACHE AND SCIATIC NEURITIS. BACK INJURIES-DEFORMITIES-DISEASES-DISABILITIES. WITH NOTES ON THE PELVIS, NECK AND BRACHIAL NEURITIS.** By *Philip Lewin*, M.D., F.A.C.S., Associate Professor of Bone and Joint Surgery, Northwestern University Medical School, Attending Orthopaedic Surgeon, Cook County Hospital; Attending Orthopaedic Surgeon, Michael Reese Hospital; Professor of Orthopaedic, Cook County Graduate School of Medicine, Chicago; Lieutenant Colonel, Medical Corps, U. S. Army. Cloth. Pp. 745, illustrated with 235 figures. Price, \$10.00. Philadelphia: Lea & Febiger, 1943.

This book gives the general practitioner the facts needed in the diagnosis and treatment of backache and sciatica and related conditions. The work is valuable to industrial surgeons and to those engaged in the armed forces in that it covers the medico-legal and military aspects of the subject which are becoming increasingly important due to industrial and military injuries and to the insistence of industrial commissions, insurance companies and courts that exact knowledge be presented to them. It covers fully the prognosis in back lesions and their dependence on etiologic factors, pathologic changes, the duration of the condition, the cooperation of the patient and the persistence of the treatment. The nervous symptoms, too, which are often out of all proportion to the severity of the injury, are fully covered. The book attempts to show exactly what should be done for the person with a backache and alternative treatments are prescribed. The operative technic is outlined step by step and the fundamental principles of modern surgical practice are precisely adhered to.

In an excellent foreword Goldthwait tells that if all the features which have been presented are considered, probably fewer patients will be operated on and the treatment of these cases as a whole will represent a greater credit to the medical profession than they do at the present time. Steindler also in a foreword adds a note of caution in his statement: "Even the most ardent advocates of surgery concede that backache is



largely a problem for conservative treatment. This means rest and immobilization . . ."

In the space of 45 chapters the author has presented embryology, anatomy of the neck, physiology and biomechanics of the back, different operative procedures, body posture, traumatic neurosis and back disorders in the military service, just to enumerate a few of the chapter headings. To those interested in or doing physical therapy there is an extensive discussion and to quote the author, "There are no sections of the body where physical therapy results in more remarkable improvement and often cure than the back and neck."

In the appendix there are short articles by leading authorities, each treating some special phase of the problem of backache. A list of some 800 references follows which is invaluable. No person who is engaged in the treatment of backache and sciatic neuritis should be without this new and exhaustive work.

**REHABILITATION, RE-EDUCATION AND REMEDIAL EXERCISES.** By *Olive F. Guthrie-Smith*, M.B.E., C.S.M.M.G., T.M.G., Principal of the Swedish Institute, London; Director of the Physical Exercise Department, St. Mary's Hospital, Member of the Council of the Chartered Society of Physiotherapists. With a Foreword by Lord Horder, G.C.V.O., M.D., F.R.C.P. Cloth. Pp. 424, illustrated. Price, \$6.00. Baltimore: The Williams & Wilkins Co., 1943.

In the foreword Lord Horder states that reconditioning and rehabilitation are in the air. He points out that the special work of the author in the direction of "suspension" methods takes a prominent place; the book gives the first full and authoritative account of these exercises that has yet appeared. The author has received the collaboration of many contributors all well known. A. Dickson Wright has presented mechanical and therapeutic principles of weightless exercises; joint manipulation, a complete chapter, has been written by James Mennell; pulley-and-weight exercises used for muscle development, by John Colson; "Recovery After Fractured Femur" has been written by Lieut. Col. Corkinis; Justina Wilson has written the chapter, "Electrotherapeutic Unit: Electricity in the Service of Rehabilitation." There are found throughout the book many instructive illustrations. The early chapters deal with early rehabilitation, the middle portion treats of work and games and the third part is occupied with passive treatments. The author who was inspired to write this book from listening to a lecture by Lord Horder has emphasized self-activated-movement. To quote Lord Horder, "I would change a great deal of so-called 'passive movement' for a very little active movement under supervision. No amount of massage, and no amount of electrical stimulation of whatever kind has the same physiological value as the natural movement carried out by the patient under supervision and careful guidance." Exercises carried out by the use of suspension ap-

paratus are discussed in detail. This is used to compensate the patient against the forces of gravity and friction. The technic for treating various parts of the body is given in detail. The advantages given for this form of exercise are that it gives freedom of movement so that more varied exercises may be used. The graded resistive exercises may be utilized. It emphasizes particularly the use of early exercise in the wards. Post operatively, this type of exercise is used to assist circulation. The book is of especial interest to those doing physical therapy.

**A TEXT-BOOK OF PATHOLOGY.** Edited by *E. T. Bell*, M.D., Contributors *E. T. Bell*, M.D., Professor of Pathology; *B. J. Clawson*, M.D., Professor of Pathology, and *J. S. McCartney*, M.D., Associate Professor of Pathology, University of Minnesota, Minneapolis, Minn. Fifth Edition, enlarged and thoroughly revised. Cloth. Pp. 862, illustrated with 448 engravings and 4 colored plates. Price, \$9.50. Philadelphia: Lea & Febiger, 1944.

This standard text-book of pathology has been thoroughly revised in its new edition. Subjects of war interest have been enlarged on such as shock, vitamin deficiencies, blast injuries and certain infectious diseases. The text is clearly written in a style suitable for students. The illustrations are generally quite excellent. Readers who are especially interested in physical medicine will find the section on arthritis disappointing, however, as it is only three pages long and unillustrated. On the whole this book is recommended as a satisfactory text for the use of the medical student.

**THE PSYCHOLOGY OF WOMEN. A PSYCHOANALYTIC INTERPRETATION.** By *Helene Deutsch*, M.D., Associate Psychiatrist, Massachusetts General Hospital; Lecturer, Boston Psychoanalytic Institute. Foreword by *Stanley Cobb*, M.D. Bullard Professor of Neuropathology, Harvard University. Volume I. Cloth. Price, \$4.50. Pp. 399. New York: Grune & Stratton, New York, 1944.

The author of this volume is an internationally known psychoanalyst who was an active participant, first as a student, then as a teacher and clinician in the growth of the science of psychoanalysis under the leadership of Sigmund Freud. Dr. Deutsch concentrated her clinical studies early on the problems of feminine psychology. The present volume discusses the individual development and personality of woman and announces that the discussion of her role as a servant of the species to be the subject of a second volume. In the organization of her material, the author deals with three distinct but related themes. The first concerns the exposition of the psychologic life of woman, starting with the young girl's psychologic development into womanhood, a process that is physiologically completed with the onset of menstruation. In the course of this process the foundations of the feminine personality are laid and "the feminine core" is definitely formed.



The four chapters in this part are: "Prepuberty," "Early Puberty," "Puberty and Adolescence," and "Menstruation." The second theme presents an analysis of the "feminine core." Special chapters are devoted to the three essential traits of femininity — narcissism, passivity and masochism, and the exposition of narcissism is combined with a description of the principal types of feminine women. But observation reveals the existence of types of women and modes of feminine behavior that seem to be at variance with our concept of femininity. The analysis of this non-feminine aspect of femininity is the subject of the third theme. The chapters relating to this theme are: "The 'Active' Woman: the Masculinity Complex," "Homosexuality" and "The Influence of the Environment."

Dr. Deutsch's book is based on wide experience as a counsellor for many girls in difficulties, as psychoanalyst for a great many women suffering from neurosis and as hospital psychiatrist. She understands and vividly reports how adolescent girls act and this throws light on some of the troubles the police are now having with 'wayward school girls.' The development treatment of the subject emphasizes how the adult attributes of femininity may be logical consequences of early reactions. The *Psychology of Women* is a great storehouse of information and a valuable contribution about feminine psychology and should be of real interest to physicians, teachers and parents.

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A SURGEON'S WORLD. AN AUTOBIOGRAPHY. By Max Thorek, M.D. Cloth. Pp. 410, with an index. Price, \$3.75. Philadelphia and New York: J. B. Lippincott Company, 1943.

It is common knowledge that America in its fusion of many peoples has absorbed the cultures of various nations and added their especial contributions to the virility of our particular civilization. The tragic events in present day Europe have especially kindled the voice of individual immigrants and minority groups to expressions of gratitude toward the America of their adoption or protective asylum, and as though in unison have pictured our land as the great haven for the racially and politically oppressed. In the labors of these pioneers to modulate their personalities in the roots of a common historic and national pattern, a rich, individualistic experience has been presented whose retelling often touches the fabulous quality of romance and fiction even though qualified as autobiographic in intent. Such essentially is the *leit motif* of Thorek's personal history.

His "Surgeon's World" could with greater truth have been captioned the Americanization of Max Thorek, because it is entirely the story of the rich experience of the Hungarian immigrant—the youth upborn from hostile, impoverished and bigoted environment into a land of opportunity where work and worship are measured in personal initiative and conscience. From long memory he weaves in detail a picture of harrow-

ing experience loosed by intolerance abroad, of self-supporting efforts in Chicago to attain his medical degree, and regales us with his trials, errors, adjustments and more than moderate success achieved by his own efforts and with the guidance of his good wife. Thorek's chronical reads like an Horatio Alger story, of from poverty to riches, except that there was no banker to raise him to opulence through the convenient door of marriage with his only daughter. Instead, his success story rose from the stress, unrest or depression of the victims of minority groups and depended largely on self-reliance, initiative, daring and perspicacity.

The autobiography can in a measure be regarded as a sentimentalists' haven. It is lush and lusty in the interpretation of a special milieu; it is warm and at times self-deprecating in the deeds accomplished; it throbs through the entire gamut of emotions to which a human is heir. It deals in broad sweeps with those elemental experiences that only a surgeon or a priest is permitted to touch—the tragedy of poverty, the searing pathos of pain, deeds of mercy, acts of compassion and the like. There are anecdotes about yeggs and "hams" that rise to the best tradition of the raconteur in the telling of many an amusing or piquant tale of picaresque characters. Stylistically the work suffers from too many changes in literary tempo and one suspects that a bit of too much "schmalz" has been used to cement the facts in this personal history. On the whole the book has that quality that tempts one to roll out all the adjectives in its favor.

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PHYSICAL DEMANDS AND CAPACITIES ANALYSIS. [PART I. PHYSICAL DEMANDS AND CAPACITIES ANALYSIS. PART II. PHYSICAL DEMANDS INFORMATION SHIPBUILDING INDUSTRY.] Cloth. Pp. 627. War Manpower Commission, San Francisco, California and Permanente Foundation Hospitals, Oakland and Richmond, California, 1944.

This large volume is the work of several groups. The preface states: "In connection with the technique of physical demands and capacities analysis itself, it is to be understood that no claim is made for its perfection and that it should be considered in the development stage. Many problems remain which can be solved only through extensive research on the part of physicians, job analysts and placement officers."

Dr. Clifford Kuh and Bert Hanman, who signed the preface, published an article on "Current Developments Affecting the Physician's Role in Manpower Utilization" in *The Journal of the American Medical Association* for May 27, 1944.

The volume overcomes the difficulties of the elaborate European approach and the shortcomings of the previous approaches in this country, such as the classification of the physical demands of jobs in terms of "none, little, moderate and great" and the classifications of the physical capacities of workers in terms of "sedentary, light, moderate and heavy work." It specifically defines the physical and environmental demands of jobs, while the physical capacities analysis based

on the same terms makes possible the placement of the disabled worker in large industries, such as the Kaiser Shipbuilding Yards.

**TUBERCULOSIS LABOR AND MANAGEMENT.** By *William Arkwright Doppler*, Ph.D., Director Industrial Relations, National Tuberculosis Association. Paper. Pp. 52. New York: National Tuberculosis Association, 1944.

This small monograph is mainly devoted to showing that by cooperation of labor, management, the medical profession and voluntary and official agencies, tuberculosis in industry can be attached without compulsion or regimentation. It also shows that group roentgen ray surveys for tuberculosis case finding in industry are of increasing importance. Such surveys, for finding tuberculosis early among apparently healthy population groups, are at present in the demonstration stage, especially in places where public measures are inadequate. This book should be read by tuberculosis workers.

**PHYSICAL BIOCHEMISTRY.** By *Henry B. Bull*, Ph.D., Associate Professor of Physiological Chemistry, Medical School of Northwestern University. Cloth. Pp. 347. Price, \$3.75. New York: John Wiley & Sons, Inc., 1943.

This excellent and scientific treatise on physical biochemistry has been prepared especially for graduate students in biochemistry, physiology, bacteriology and neurology. The medical students at Northwestern University also attended the lectures on which this text was based. For any physician who is interested in the scientific basis of physical medicine, this volume will be of extreme interest.

Starting with a chapter on atoms and molecules, there follow chapters on energetics, reaction kinetics, electrostatics and dielectrics, ions in solution, electromotive force cells, acids and bases, oxidation-reduction, electrical conductance, electrokinetics, surface activity, colloidal solutions, viscosity and the flow of liquids, diffusion, the ultracentrifuge, osmotic pressure, membranes and cell penetration, and finally a chapter on colloidal structures.

The presentation is concise, clear and authoritative. The book is extremely well documented throughout. Excellent figures and tables clarify the subject matter. This textbook is recommended to all physicians who desire further knowledge concerning the increasingly important subject of physical biochemistry.

**INFANTS WITHOUT FAMILIES. THE CASE FOR AND AGAINST RESIDENTIAL NURSERIES.** By *Anna Freud* and *Dorothy Burlingham*. Cloth. Pp. 128. Price, \$2.00. New York: Medical War Books, International University Press, 1944.

This is a study of war-time educational work with homeless children. American generosity enabled the keeping up of three homes in and near

London for children whose family life had been broken up owing to war-time conditions. These homes were run along residential lines, offering the security of a stable home with opportunities for individual development. The authors attempt to evaluate the advantages and disadvantages of residential life at different phases, and different aspects of the infant's development. They record their observations and their comments on the psychologic development under family and residential conditions so as to contribute a better understanding of the question "Should residential nurseries be maintained, and if so, can they be changed so as not to produce the 'institutional' child?" They come to the conclusion that there are realms in the infant's life where the residential nursery can be helpful by creating excellent conditions for certain types of development; but that there are others where residential homes have to recognize their limitations if they want to face and fight more effectively the serious consequences of such limitations.

**PSYCHOANALYSIS TODAY.** Edited by *Sandor Lorand*, M.D. Cloth. Price, \$6.00. Pp. 404. Medical War Books. New York: International University Press, 1944.

It is just half a century since Freud made his initial contribution of psychoanalytic thought and with it inaugurated a new method of treating illness. Psychoanalysis today is still a young and growing science, but it is already one of the powerful influences affecting our social structure. It has revolutionized the fields of pedagogy, criminology, anthropology, religion and art; deepened the understanding of human interrelationships. In the field of medicine and psychiatry it has brought about an understanding of normal and abnormal personality development and has thrown new light on its dynamic structure. The editor of this interesting volume, himself a recognized leader in psychoanalysis, has secured essays of twenty-nine eminent psychiatrists and psychoanalysts, all of whom have made important contributions in these fields. The titles of some of these articles are: "Freud's Influence on Medicine," by Sandor Ferenczi, M.D.; "Psychoanalysis and Internal Medicine," by Smith Ely Jelliffe, M.D.; "Psychosomatic Medicine," by Flanders Dunbar, M.D.; "Child-Parent Relationship," by C. P. Oberndorf, M.D.; "Sexuality and Its Role in the Neuroses," by A. A. Brill, M.D.; "Character Formation," by Sandor Lorand, M.D.; "Neuroses and Psychoses," by Paul Schilder, M.D.; "Organic Psychoses," by J. H. W. Van Ophuijsen, M.D.; "Problems of Crime," by Paul Schilder, M.D.; and "Psychoanalysis and Literature," by Fritz Wittels, M.D.

The contributions of this volume offer a story of the growth of psychoanalysis and depict also its present day attitudes. They contain a wealth of information for parents, social workers, educators, physicians, students of psychology and others to whom the problems of contemporary life are important.

# PHYSICAL THERAPY ABSTRACTS

## Rehabilitation Program at Lawson General Hospital. Norman E. Titus.

U. S. Army M. Dept. 75:88 (April) 1944.

Rehabilitation has earned an important place in the war effort as a method of saving manpower. The armed forces need to salvage every bit of the power-to-fight in every man, even though he never carries a gun. Because of the need for industrial workers, rehabilitation should be begun early in Army hospitals so that, if not returned to duty, a man may be available to industry to help the war effort. The need for rehabilitation during this war is greater than in any previous mobilization. Rehabilitation during the last war did not make the impression on surgery that it has already made today; however, what was done then was sufficient to make the civilian patient, after the war, demand it when he was injured in industry. This demand caused more interest in the subject and a more sensible evaluation of what could be accomplished. In this war, surgeons have very early demanded that rehabilitation be not relegated to post-war days.

## Low Back Pain: Its Prevention and Treatment. Hugh Burt.

Brit. J. Phys. Med. 7:17 (Jan.-Feb.) 1944.

The problem of low back pain is difficult because the number of conditions which give rise to this symptom is large and the exact pathology of many of the conditions obscure.

This paper is concerned with two groups of cases: those due to bad posture and those due to lesions in the deep structures of the back and buttock (Steindler's posterior division syndrome). Faulty posture affects the problem in three ways: in itself it gives rise to backache, it predisposes to back pain from other causes; it prolongs the time of recovery. There are four main types of faulty posture: the lordotic back, the flat back, the sway back and the syndrome of the shop girl's hip. Postural backache could be prevented if treatment were instituted in schools, before persons were to enter certain trades or professions and following pregnancy. Its treatment is by exercises, preceded in certain cases by the use of heat and massage. Steindler describes six common sites for pain producing lesions in the back and buttock. Treatment is made more difficult by the time that elapses between onset of symptoms and institution of treatment and by the "functional top dressing" which develops in long-standing cases. Simple physical measures are likely to be successful in early cases but later manipulation, epidural and novocain injections are necessary to bring about cure.

## Vertebral and Sacro-Iliac Strain in the Soldier. E. Gordon Fleming.

J. Roy. Army M. C. 82:31 (Jan.) 1944.

Two common causes of disability are lower lumbar and sacroiliac pain. Often by the soldier's own volitional statement but more frequently only by careful questioning this is found to have been initiated directly as the result of some considerable physical strain. The man has been cranking a Diesel engine or has lifted a heavy weight or he has been subjected to some one of the other many stresses which fall to the serviceman's lot.

The diagnosis in this case was based solely on the clinical findings. As in all similar cases there was negative radiological evidence. But there was definite tenderness to the right of the spinous process of the 5th lumbar vertebra and slight rigidity of the erector spinae of the right side. These signs, together with the history and in the absence of other pathological findings, were sufficient on which to form the diagnosis of lumbo-sacral strain.

The manipulation which was carried out is relatively easy to perform. The patient lies on the affected side as close as is possible to the edge of the operating table. The uppermost leg is flexed on the thigh to the extent that the dorsum of the foot is brought into contact with the popliteal space of the lower leg. The upper leg and foot are held in this position by an assistant. The operator now makes three contacts with the patient. Assuming that the patient is lying on his right, the affected, side the operator, standing as closely as possible to the operating table, places (a) his left hand on the left shoulder of the patient; (b) the fingers of his right hand firmly in contact with the right of the spinous processes of the patient's lumbar vertebrae, and (c) his right knee over the knee of the patient's flexed left leg.

Then with a synchronization of movement three forces are applied. The patient's left shoulder is forced backwards by the left hand; the lumbar spine is pulled forwards by the fingers of the right hand and at the same time the operator's right knee presses down the patient's left thigh.

These three forces, which must be made simultaneously, have the effect of rotating the lumbar spine on the sacrum in the desired direction; in this particular instance, from right to left.

## Phototherapy of Burns. P. M. Leonenko.

Am. Rev. Soviet Med. 1:340 (April) 1944.

Preliminary treatment of the wound was limited to washing the surface and surrounding skin of visible dirt and clothing fragments and to cleansing the region around the wound with benzine.

Blisters were untouched for several days. After preliminary cleansing, the wound surface and 5 to 10 cm. of the healthy adjacent skin were immediately exposed to the quartz lamp. Later, the patient was placed in a cabinet with electric lamps (thermo-light). The optimal temperature in the cabinet was found to be 34 to 36 C., depending on the size of the burn, the rate of heat dissipation and the subjective state of the patient. Sterile sheets were placed under the burned areas. Chemotherapeutic methods were eliminated and only radiant energy was used.

Further treatment of the wound consisted in regular exposure to the quartz lamp in combination with thermo-light. Weak erythematous doses were given every day for the first four or five days. After this period, the treatment was given every two or three days in gradually increasing doses. If the pain was very great, a novocaine solution was applied; the skin folds where painful fissures formed were covered with vaseline.

The author found that preliminary treatment with a quartz lamp reduced pain to a considerable degree and served to combat shock. Ultra-violet rays, falling on the exposed surface, reach the capillary network, are absorbed by the blood and stimulate the protective mechanisms of the body. The general condition of the patient was improved to a considerable degree; the temperature begins to fall; appetite and sleep improve. Local regenerative processes are activated by phototherapy and contribute to rapid healing of the wound without formation of scars (cosmetic effect).

#### Rehabilitation. Stanley D. Large.

J. Roy. Army M. C. 80:10 (March) 1943.

"Rehabilitation" may be defined as restoration to a state of robust health after injury or illness. It thus connotes the restoration of free movement to stiffened limbs, of vigor to tired minds, of courage and confidence to quailing spirits; in short, the physical, mental and ethical toning-up of the whole individual being. Obviously necessary physically for most persons before resuming work after even a week in bed, it is less obviously necessary psychologically. The former need has long been recognized, the latter has for too long been neglected and hence its history is brief.

#### Electric Convulsive Therapy With Emphasis on Importance of Adequate Treatment. Lothar B. Kalinowsky.

Arch. Neurol. & Psychiat. 50:660 (Dec.) 1943.

The value of shock treatment of mental disease is still disputed. At present electric convulsive therapy is probably the most widely used method. With some disorders indiscriminate use is favored because of its simplicity, whereas with others inadequate application is responsible for failures.

A review of electric convulsive therapy is presented on the basis of experience with 1,500 patients treated in two hospitals with different types of material. The importance of adequate treat-

ment is emphasized and several technical suggestions are given.

In the manic-depressive psychoses, manic states need more intense treatment than depressive states. Involutional psychosis of the paranoid type shows a less favorable response than does involutional depression.

Stress is placed on the efficacy of electric convulsive therapy in cases of acute schizophrenia when a sufficient number of convulsions is administered; discontinuation of treatment after the usually early clinical improvement leads almost invariably to relapse and is the most important reason for failure of this method in treatment of schizophrenia.

The results of electric convulsive therapy are less satisfactory for the psychoneuroses than for the psychoses. The author reports that no fatalities occurred; complications were rare and can largely be prevented.

Electroencephalographic changes and confusional states should not lead to discontinuation of treatment until an adequate number of convulsions have been given. Physical diseases may not be contraindications to therapy if they are aggravated by the mental condition.

#### Acute Calcified Subacromial or Subdeltoid Bursitis. F. R. Guido.

California & West. Med. 60:69 (Feb.) 1944.

Guido observed 11 cases of calcified bursitis. Bosworth discovered the condition in 165 of 6,061 persons examined, an incidence of 2.7 per cent. The possibility of calcified subacromial bursitis must always be considered when dealing with an acute painful shoulder. Diagnosis can be made by fluoroscopy and x-ray examination. Repeated trivial trauma is probably the most important etiologic factor. Focal infection probably plays no part in the production of the calcium deposit. The condition has its inception in the tendons of the short rotators of the humerus, especially the supraspinatus, and the subacromial bursa is secondarily involved. The calcium deposit may be present for a considerable length of time without the production of acute symptoms. The removal of the calcium deposit by surgical incision is the treatment of choice in the majority of cases. This is especially true for the acute fulminating type. Relief is immediate, complete and permanent. Other methods of treatment have also proved successful.

#### Temperature in Shock: I. Local Effects. J. Devine.

M. J. Australia 2:473 (Dec. 11) 1943.

It was Devine's impression that among the casualties in the hospital at Tobruk those who had been for some hours in the sea, in the cold of the Mediterranean winter, arrived at the hospital in good general condition, even though they had extensive burns and wounds, and that they appeared to be in better condition than those who came from the surrounding land areas. These men had all been chilled generally as well as



locally. The author decided to investigate whether the local application of a moderate degree of cold would decrease the local loss of plasma following shock-producing trauma. He describes experiments on 9 dogs in which a leg was subjected to trauma by blows with a mallet after a tourniquet had been put on. Then, with the tourniquet still in position, the leg was placed in a water bath of 50 C. for twenty minutes. This procedure had been found to produce shock when the tourniquet was released. When the tourniquet was released, the water was kept at 50 C. in 3 of the dogs, and in that of 3 others it was kept at about 8 C. The carotid blood pressure was continuously recorded, and every ten minutes the limb volume was recorded. The local increase in limb volume of those limbs kept at an average temperature of 52 C. was over three times that of limbs kept at an average temperature of 8 C. Only one dog whose leg was kept in a warm bath was alive at the end of one hundred minutes following the release of the tourniquet. The clinical application of the reported experimental work is that, first, heat should not be applied in the neighborhood of injuries that are likely to cause shock, for if this is done local loss of circulating fluid to the tissues will be increased; second, cooling of a traumatized limb may be effective in lessening the local loss of fluid from the circulation and may thus, in the light of experimental work published by others, be helpful in modifying the onset of shock.

**Hyperpyrexia in the Treatment of Acute Ocular Inflammations. Harry C. Knight; Mayo Emory, and Neil Callahan.**

*Am. J. Ophth.* 27:388 (April) 1944.

The treatment of acute inflammatory diseases of the eye has resolved itself into three phases: (1) standard ophthalmologic management, including local therapy and chemotherapy; (2) the location and elimination of infectious foci; (3) pyretotherapy, which usually consists in giving the patient frequent injections of some pyretogenic agent, usually a foreign protein (typhoid vaccine or sterile milk). In most cases the mild febrile response obtained, usually less than 104 F. and of short duration, is insufficient to give any material benefit in severe cases.

The results of pyretotherapy in the treatment of inflammatory diseases of the eye are excellent in many cases and offer the only means of saving partial or total vision.

The most striking immediate result of treatment is relief of pain. The restoration of vision is slightly more delayed, but remarkable in most cases, depending on three factors: (a) the duration of the process before the start of fever therapy; (b) the number of treatments given while under therapeutic regimen; (c) the close cooperation of the ophthalmologist, first in persisting in the local treatment and second in determining the point at which treatment is to be discontinued.

It is evident that much vision may be saved by this method. It is desirable, therefore, that

ophthalmologists become more aware of the usefulness of this therapeutic method.

**Effect of Prolonged Wet and Cold on the Extremities. Russel H. Patterson.**

*Bull. U. S. Army M. Dept.* 75:63 (April) 1944.

A study is presented of cases of injury of the extremities due to prolonged exposure to wet and cold. These casualties from the taking of Attu were received at Letterman General Hospital twenty-six days after invasion of that island.

Exposure to wet and cold varied from three to fourteen days. They noticed, within twelve to twenty-four hours, throbbing, tingling, cramping and increasing numbness of the feet. Many said, "We felt as if walking on wooden feet." Some had to crawl, thus sustaining extensive ulcerated lesions of the knees. On removal of the boots the feet were blue or mottled blue and white, swollen and the soles were waxy white; those severely damaged soon become blistered, more swollen and painful; the less severely damaged became red, hot and swollen. Cramp in the foot and calf muscles was a prominent symptom.

The fingers become numb later than the toes, probably because the hands could be exercised, thus stimulating circulation. Numbness in the fingers occurred after about three days. Only one patient showed gangrene of a finger tip; nearly all, however, showed desquamation of the finger tips as well as slight swelling, hypesthesia and a mottled, cyanotic color. None had more than first degree thermal trauma of the face or ears.

**Early Rehabilitation in Abdominal Surgery. Alan Shorter.**

*Lancet* 1:244 (Feb. 19) 1944.

Rehabilitation is accepted as an essential part of the treatment of all ailments. Shortage of manpower has displayed its importance in war-time and a comprehensive medical service after the war must provide for it.

Rehabilitation needs not only surgical or medical skill but also "psychological management" aided by physical medicine of all kinds. In abdominal surgery this means cooperation between surgeon, physical therapist, general practitioner and nursing staff. What is wanted is not so much trained "rehabilitationists" as collaboration of every member of the team with the surgeon. The patient must feel the sustained interest of his surgeon from his entry into hospital until his return to work. Without the general practitioner success is impossible.

After abdominal operations most patients are afraid to breathe deeply, let alone cough, because deep breathing is painful and they are afraid of bursting their stitches. This fear is especially deeply embedded in the lay mind in relation to operations for hernia. It is a relic of the days when the postoperative hernia patient was kept flat on his back for three weeks.

The scheme covers the preoperative and postoperative stages. Before operation the patient is



instructed in breathing and coughing, and briefly in the movements he will be expected to do afterwards.

**Lightning and the Central Nervous System. J. H. Paterson, and J. W. Aldren Turner.**

J. Roy. Army 82:75 (Feb.) 1944.

From time to time lightning flashes have resulted in casualties and some of them have been fatal but their number has been so small that little attention has been paid to them. In other countries, for instance in South Africa, lightning constitutes a definite menace to human life. The authors have recently had the opportunity of treating a case of lightning stroke within a few hours of the incident and it is described not only because it presented unusual neurologic features but also because it is infrequent for such a case to be investigated in hospital at such an early stage.

Comments are made on the nature of lightning stroke and its clinical and pathologic effects on the central nervous system. Suggestions are offered for the prevention and treatment of lightning stroke.

**Threshold Variations to Vagus Nerve Stimulation. C. L. Burstein; Stevens J. Martin, and E. A. Rovenstine.**

J. Thoracic Surg. 13:52 (Feb.) 1944.

It is commonly believed that irritation of the vagus nerve during an intrathoracic operation is likely to result in circulatory reactions. Capps and Lewis focused attention on vagal reflexes during thoracic manipulations in 1908. In their experiments the stimulation was applied to the pleura and the circulatory response has since been designated by the term they used, namely, pleural reflexes. Recently it was shown that in the dog and in man stimulation of the abdominal vagus produced little or no circulatory response. Such observations prompted an investigation to determine whether differences in sensitivity of the vagus trunk at different levels could be demonstrated more thoroughly.

Faradic stimulation of the vagus nerve at different points along its course results in varying degrees of cardiovascular depression. Using a constant stimulus, the most marked changes were noted upon stimulating the upper thoracic segment of the vagus. Lesser effects were seen when the cervical vagus was stimulated. Little or no effect followed stimulation of the lower thoracic and upper abdominal branches of the vagus.

**Interference Between the Influenza Viruses. The Effect of Active Virus Upon the Multiplication of Influenza Viruses in the Chick Embryo. James E. Ziegler, and Frank L. Horsfall.**

J. Exper. Med. 79:399 (April 1) 1944.

It has been observed in certain instances that the presence in an organism of one virus prevents or inhibits the multiplication of another

virus in that organism. This phenomenon has been called "interference."

The initial observations on the interference phenomenon were made in virus diseases of plants. In 1929, McKinney observed that plants infected by tobacco mosaic virus resisted infection with a variant strain of this virus. Thung, in 1931, was apparently the first to study the phenomenon in detail in plants. Numerous examples of interference between plant viruses have been reported subsequently. A review of the literature concerning the interference phenomenon in virus diseases of plants was published by Price.

Influenza A or influenza B virus rendered non-infective by ultraviolet radiation was found to be capable of producing interference with the multiplication of active influenza viruses in the chick embryo. Certain temporal and quantitative relations affecting the interference phenomenon with this host-virus system were studied. An hypothesis of the mechanism of interference between the influenza viruses is proposed and discussed.

**Tennis Elbow.**

Brit. J. Phys. Med. 7:24 (Jan.-Feb.) 1944.

The term, tennis elbow, is best reserved for lesions of the extensor group of muscles in the neighborhood of the elbow. The symptoms are felt at the outer aspect of the elbow region and may be referred down the radial side of the forearm. If the pain reaches the hand, it nearly always occupies the middle and ring fingers (seventh cervical segment). Rarely does the pain radiate to the extreme boundary of the eighth cervical segment, as it is felt in the ring and little fingers. If so, the symptoms superficially resemble those of an ulnar neuritis but the signs of course have nothing in common.

Diagnosis is simple and depends on the discovery that a resisted extension movement at the wrist sets up pain felt near the elbow. The diagnosis can be given refinement by testing the extensor group of muscles one by one. If this is done, it will be found that extension at the wrist hurts more when resisted by pressure on the knuckles than on the fingertips. Resisted radial deviation hurts; ulnar deviation does not. The conclusion is therefore drawn that the extensor carpi radialis muscles contain the lesion. Moreover it is clear that a pain felt at the elbow and evoked by a resisted wrist movement does not arise from the elbow joint itself nor from the two bursae, the radiohumeral and the superficial epicondylar, which have been suspected in the past. The fact, then, that a patient has a tennis elbow is easy to ascertain; difficulty arises only when the site of the lesion in the radial extensor muscles has to be determined. Every effort must be made to arrive at a correct localization, for on this the prognosis and treatment entirely depend. The misleading feature in palpation is the fact that considerable tenderness is present hereabouts in normal subjects. Hence the two sides must be carefully compared.

### Local Asphyxia — Allen

(Continued from page 396)

Variations of temperature can be used to protect against the injury of asphyxia in some parts and to augment its destructiveness in other parts. Further employment of the thermal factor is planned.

1031 Fifth Avenue.

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### Grenz Rays — Bluefarb

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### Rehabilitation in Naval Convalescent Hospital — Drewyer

(Continued from page 414)

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**PRELIMINARY PROGRAM****INTENSIVE INSTRUCTION SEMINAR****American Congress of Physical Therapy****23rd ANNUAL SESSION**

September 6, 7, 8, 9, 1944

HOTEL STATLER

CLEVELAND, OHIO

**SCHEDULE OF INSTRUCTION COURSE****WEDNESDAY, SEPTEMBER 6**

- 8:00 to 9:00—(1) *Massage, Physiologic Basis.* SCULL. Parlor E, Second Floor.
- 8:00 to 9:00—(2) *Physical Therapy in General Hospital Organization.* MOLANDER. Parlors F and G, Second Floor.
- 9:00 to 10:30—(3) *Shoulder Girdle, Functional Anatomy.* QUIRING. Parlor E, Second Floor.
- 9:00 to 10:30—(4) *Posture.* HANSSON. Parlors F and G, Second Floor.
- 1:00 to 2:00—(5) *Rehabilitation, General Army Hospital.* HUDDLESTON. Parlor E, Second Floor.
- 1:00 to 2:00—(6) *Peripheral Nerve Injuries.* HINES. Parlors F and G, Second Floor.

**THURSDAY, SEPTEMBER 7**

- 8:00 to 9:00—(7) *Heat, Physiologic Basis.* KOBAC. Parlor E, Second Floor.
- 8:00 to 9:00—(8) *Protective Body Mechanics.* JESSIE WRIGHT. Parlors F and G, Second Floor.
- 9:00 to 10:30—(9) *Muscle Testing (Demonstration).* BENNETT and ALICE PLASTRIDGE. Parlors F, G and H, Second Floor.
- 1:00 to 2:00—(10) *Rehabilitation, Navy Hospital.* DREWYER. Parlor E, Second Floor.
- 1:00 to 2:00—(11) *Physical Therapy in Rheumatic Diseases.* PAUL. Parlors F and G, Second Floor.

**FRIDAY, SEPTEMBER 8**

- 8:00 to 9:00—(12) *Exercise, Physiology.* KEYS. Parlor E, Second Floor.
- 8:00 to 9:00—(13) *Low Voltage Currents.* OSBORNE. Parlors F and G, Second Floor.
- 9:00 to 10:30—(14) *Hip Joint, Functional Anatomy.* FRANCES BAKER. Parlor E, Second Floor.
- 9:00 to 10:30—(15) *Electrosurgery.* SCHMIDT. Parlors F and G, Second Floor.

1:00 to 2:00—(16) *Rehabilitation, Industry.* STORMS. Parlor E, Second Floor.1:00 to 2:00—(17) *Fractures, Physiologic Basis of Physical Therapy.* KENDRICK. Parlors F and G, Second Floor.**LECTURERS FOR INSTRUCTION COURSE**

**FRANCES BAKER, M.D.,** Instructor, Orthopedic Surgery, University of California Medical School; Director, Department of Physical Therapy, University of California Hospital, San Francisco;

**ROBERT L. BENNETT, M.D.,** Director of Graduate School of Physical Therapy; Director, Physical Medicine, Georgia Warm Springs Foundation, Warm Springs, Ga.;

**LT. COMDR. G. E. DREWYER (MC) U.S.N.R.,** Director of Rehabilitation, U.S.N. Convalescent Hospital, Glenwood Springs, Colo.;

**KRISTIAN G. HANSSON, M.D.,** Assistant Professor, Orthopedics, Cornell University Medical College; President, American Congress of Physical Therapy, New York;

**HARRY M. HINES, Ph.D.,** Professor of Physiology, College of Medicine, State University of Iowa, Iowa City, Ia.;

**ORA LEONARD HUDDLESTON, M.D.,** Assistant Professor, Physiology, Medical Director, of Physical Therapy (Inactive), University of Colorado School of Medicine and Colorado General Hospital, Denver, Colo.;

**J. I. KENDRICK, M.D.,** Orthopedist, Cleveland Clinic, Cleveland;

**ANCEL KEYS, Ph.D.,** Director of the Laboratory of Physiological Hygiene; Professor of Physiology and Physical Education, University of Minnesota, Minneapolis.

**DISRAELI KOBAC, M.D.,** Assistant Professor Medicine (Physical Therapy) Rush Medical College, University of Illinois, Chicago;

**CHARLES O. MOLANDER, M.D.,** Associate in Physical Therapy, Northwestern University Medical School; Director, Physical Therapy, Michael Reese Hospital, Chicago;

**S. L. OSBORNE, Ph.D.,** Assistant Professor, Physical Medicine, Northwestern University Medical School, Chicago;

**WILLIAM D. PAUL, M.D.,** Assistant Professor of Medicine, Head of Department of Physical Therapy; Assistant Professor in Medicine, University Hospital, College of Medicine, State University of Iowa, Iowa City, Ia.;

**ALICE LOU PLASTRIDGE**, Assistant Director, Post-Graduate School of Physical Therapy, Georgia Warm Springs Foundation, Warm Springs, Ga.;

**DANIEL P. QUIRING, Ph.D.**, Associate Professor of Biology, Western Reserve University, Cleveland;

**WILLIAM H. SCHMIDT, M.D.**, Associate Professor of Physical Therapy, Jefferson Medical College; Philadelphia; Director, Department of Physical Therapy, Jefferson Hospital; Roentgenologist to St. Mary's Hospital, Philadelphia.

**C. WESLER SCULL, Ph.D.**, Assistant Professor of Chemistry (Medicine) Graduate School of Medicine, University of Pennsylvania, Jenkintown, Pa.;

**HAROLD D. STORMS, B.A., M.D.**, Lieut. Col. R.C.A.M.C., Medical Director, the Clinic The Workmen's Compensation Board of Ontario, Toronto, Can.;

**JESSIE WRIGHT, M.D.**, Director, D. T. Watson School of Physical Therapy; Director, Physical Therapy, Presbyterian and Children's Hospitals, Pittsburgh.

### THE INSTRUCTION COURSE

The instruction course will be given from 8 to 10:30 a.m., and from 1 to 2 p.m. on the days of Wednesday, Thursday and Friday during the convention week, enabling attendance at both the course and scientific session during the same period.

Each registrant is allowed the choice of one lecture during a period, there being two instruction periods every day. Nine lectures may be selected from the seventeen listed. The charge for the schedule of nine lectures is \$15.00. Less than nine lectures may be scheduled for \$2.00 per lecture. The right is reserved to reject any application if the Course Committee finds it desirable to do so. Registration for specific courses cannot be guaranteed when quotas are filled.

Those who have not completed their registration should do so before attending any of the sessions. No one will be permitted attendance at any of the seminar sessions without official registration card. Registration may be completed on Tuesday, September 5, at the Hotel Statler at the registration desk of the Congress. Lectures will commence promptly at 8:00 a.m. on Wednesday.

### SOCIETY OF PHYSICAL THERAPY PHYSICIANS

The Society of Physical Therapy Physicians will hold its annual meeting in the Pine Room, September 6, 12:30 Noon, luncheon. If you are a member of this Society you are urged to make every effort to be present.

### AMERICAN REGISTRY OF PHYSICAL THERAPY TECHNICIANS

The annual meeting of the Boards of the Registry will be held Thursday, 12:00 Noon, Luncheon Parlor D.

### EDUCATIONAL CONFERENCE

(By invitation)

**THURSDAY, September 7 —**

**9:00 to 12:00 Noon**

**Parlor E — 2nd floor**

Chairman — **EARL C. ELKINS**, Rochester, Minnesota.  
Leader of Discussion — **HOWARD CARTER**, Chicago.

## APPLICATION FOR INSTRUCTION COURSE

In Conjunction with the  
23rd Annual Scientific and Clinical Session  
of the

## AMERICAN CONGRESS OF PHYSICAL THERAPY

September 6, 7, 8, 9, 1944

Hotel Statler, Cleveland, Ohio

Name.....  
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Address.....

(If physician, answer.)

Are you a member of the A. M. A.?.....Are you

a member of your county medical society?.....

Give name of Co. Med. Soc. ....

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Are you a member of the American Registry of Physical

Therapy Technicians?.....If you are not a regis-

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physician who will sponsor you.....

After reading the general information and schedule of courses offered, make up the schedule you wish to take, listing the courses by hour and day—watch, please do not duplicate:

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Please make check payable to and mail it with your application to

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**30 North Michigan Avenue**

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**SPECIAL EVENTS****TUESDAY, September 5**

7:00 P. M.

**Dinner for Executives**

(By invitation)

**Parlor C****WEDNESDAY, September 6**

12:00 Noon

**Luncheon Meeting for Members  
Society of Physical Therapy Physicians  
Pine Room**

5:00 P. M.

**Annual Congress Business Meeting  
Grand Ball Room**

8:00 P. M.

**Formal Opening 23rd Annual Session  
Grand Ball Room****THURSDAY, September 7**

9:00 to 12:00 Noon

**Educational Conference**

(By invitation)

**Parlor E**

12:00 Noon

**Luncheon Registry Boards**

(By invitation)

**Parlor D**

1:00 to 3:00 P. M.

**American Physiotherapy Association  
Special Presentation by Ohio Chapter  
Parlor C**

5:00 P. M.

**Meeting Members Editorial Board**

(By invitation)

7:00 P. M.

**Annual Banquet—Informal  
Euclid Ball Room****FRIDAY, September 8**

12:00 Noon

**Motion Picture****Psychiatry in Action****Parlors E, F and G****SATURDAY, September 9**

1:30 P. M.

**Tour of Hospital Physical Therapy Departments.****GENERAL SCIENTIFIC SESSION****WEDNESDAY, September 6 — 10:45 A. M.****GRAND BALL ROOM****OFFICERS OF THE SECTION**

Chairman — CHRISTOPHER J. McLOUGHLIN, Atlanta, Ga.

Secretary — ISADOR LEVIN, Washington, D. C.

**Mineral Water Therapy. An Appraisal.**

M. B. JARMAN, M.D., Medical Director, The Homestead, Hot Springs, Va.

**Medical Legal Aspects of Physical Medicine.**

LOUIS J. REGAN, M.D., LL.B., Member, State Bar of California, Los Angeles, and

JOHN S. HIBBEN, M.D., Senior Attending Physician in Physical Therapy, Huntington Memorial and St. Luke's Hospital, Pasadena.

**Peripheral Vascular Reactions After Sympathectomy.**

KARL HARPUDER, M.D., Assistant Clinical Professor, Medicine, College of Physicians and Surgeons, Columbia University, New York, N. Y.

**Medical Physics.**

OTTO GLASSER, Ph.D., Head of the Department of Biophysics, Cleveland Clinic Foundation, Cleveland.

**GENERAL SCIENTIFIC SESSION****WEDNESDAY, September 6 — 2:30 P. M.****GRAND BALL ROOM****OFFICERS OF THE SECTION**

Chairman — ROBERT M. STECHER, Cleveland, Ohio.

Secretary — BEN L. BOYNTON, Baltimore, Md.

**Industrial Rehabilitation.**

CARL M. PETERSON, M.D., Secretary, Council on Industrial Health, American Medical Association, Chicago.

**Functional Treatment of Fractures and Other Injuries.**

HARLAN WILSON, M.D., Professor, Orthopedic Surgery, Ohio State University Medical School; Resident Surgeon-in-Chief, American Hospital in Britain, 1942, Columbus, Ohio.

**A Comprehensive Rehabilitation Center.**

WALTER J. ZEITER, M.D., Head of the Department of Physical Medicine, Cleveland Clinic Foundation and Consultant in Physical Medicine, Rehabilitation Center, Cleveland;

SHELBY G. GAMBLE, M.D., Assistant in Physical Medicine, Cleveland Clinic Foundation, Cleveland, and

BELL GREVE, Executive Secretary, Rehabilitation Center, Cleveland.

**A Plea for a More Uniform Terminology.**

FRANK H. EWERHARDT, M.D., Assistant Professor, Physical Therapy, Washington University School of Medicine, St. Louis, Mo.



**Physiologic Studies and Technics Employed During Fever-Chemotherapy of Early Syphilis.**

(From the Fever-Chemotherapy Section, Chicago Intensive Treatment Center of the Chicago Board of Health.)

H. WORLEY KENDELL, Surgeon (R) U. S. P. H. S., Chicago;

ROBERT C. CRAIG, P.A. Surgeon (R) U. S. P. H. S., Chicago,

and

GEORGE X. SCHWEMLEIN, P.A. Surgeon (R) U. S. P. H. S., Chicago.

**Relation of the Temperature of the Cabinet, the Patient and Pulse Rate.**

MILTON G. SCHMITT, M.D., Associate in Physical Medicine, Northwestern University Medical School, Chicago.

## **EVENING SESSION**

**WEDNESDAY, September 6 — 8 P. M.**

### **GRAND BALL ROOM**

#### **OFFICERS OF THE SECTION**

Chairman — KRISTIAN G. HANSSON, New York, N. Y.

Secretary — RICHARD KOVÁCS, New York, N. Y.

## **FORMAL OPENING OF THE 23RD ANNUAL SESSION**

### **INVOCATION**

The Reverend H. W. Bartels  
Pastor, Grace Evangelical Lutheran Church,  
Cleveland Heights

### **ADDRESS OF WELCOME**

### **INDUCTION OF PRESIDENT-ELECT**

### **ADDRESS**

**Education of the Medical Student in Physical Therapy.**

Miland E. Knapp, M.D., Minneapolis

**The Work of the National Foundation for Infantile Paralysis.**

BASIL O'CONNOR, President, The National Foundation for Infantile Paralysis, New York, N. Y.

**Physical Restoration in Vocational Rehabilitation.**

DEAN A. CLARK, Senior Surgeon (R) U. S. P. H. S., Chief Medical Officer, Office of Vocational Rehabilitation, Washington, D. C.

**Rehabilitation in the Navy.**

HOWARD H. MONTGOMERY, Capt. (MC), U. S. N.

## **GENERAL SCIENTIFIC SESSION**

**THURSDAY, September 7 — 10:45 A. M.**

### **GRAND BALL ROOM**

#### **OFFICERS OF THE SECTION**

Chairman — MAX K. NEWMAN, Detroit.

Secretary — G. J. P. BARGER, Washington, D. C.

#### **Measurement of Joint Motion.**

CATHERINE CORSON WEST, M.D., Clinical Instructor, Department of Radiology and Physical Therapy, University of Minnesota Medical School, Minneapolis.

#### **Optimal Frequencies for Short Wave Diathermy.**

H. J. HOLMQUEST, B.S., B.S. (M.E.), Lecturer in Applied Physics, Department of Physical Medicine, Northwestern University Medical School; Research Engineer, General Electric X-Ray Corporation, Chicago.

#### **Physical Therapy in Geriatrics.**

DON J. ERICKSON, M.D., Assistant, Section on Physical Medicine, Mayo Clinic, Rochester, Minnesota.

## **SPECIAL PRESENTATION**

**Ohio Chapter of American Physiotherapy Association**

**THURSDAY, September 7 — 1:00 P. M.**

### **Parlor C**

#### **OFFICERS OF SECTION**

Chairman — JESSE L. STEVENSON, President, American Physiotherapy Association.

Secretary — RUTH PRATT, President Ohio Chapter, American Physiotherapy Association.

#### **A Rehabilitation Center for the Injured Worker.**

Guest Speaker: JOHN S. COULTER, M.D., Professor and Chairman of Department of Physical Medicine, Northwestern University Medical School; Chairman, Council on Physical Therapy, American Medical Association, Chicago.

### **PRACTICAL DEMONSTRATION**

*Walking Receducation.*

CATHERINE GRAHAM, Chief Physical Therapy Technician, Mt. Sinai Hospital, Cleveland.

#### **I. Preparation of the patient for walking**

Good body alignment during the period of bed rest  
Exercises to maintain and develop good muscle tone  
Psychologic preparation of the patient and family  
Shoes

#### **II. Teaching normal standing posture, balance and shifting of weight**

## III. Crutches

Types of crutches — advantages and disadvantages of each  
 Measurement — length and height of hand bar  
 Padding  
 Tips — examples of various kinds  
 Canes — height, strength

## IV. Demonstration of various methods of using crutches and indications for the use of each type

Psychologic Factors

Gaits

Four Point

Two Point

Both crutches and the opposite leg

Swinging

## V. Desired end results in teaching walking

Getting in and out of bed and chair  
 Going up and down stairs and inclines  
 Getting in and out of car  
 Getting in and out of bathtub  
 Toilet.

## VI. Adaptations in furniture and equipment to help carry out activities listed

## VII. Teaching walking as crutches and canes are discontinued.

## GENERAL SCIENTIFIC SESSION

THURSDAY, September 7 — 2:30 P. M.

GRAND BALL ROOM

## OFFICERS OF THE SECTION

Chairman — FRED B. MOOR, Los Angeles.

Secretary — WALTER S. McCLELLAN, Saratoga Springs, N. Y.

## Some Problems in the Administration of a Physical Therapy Department.

HOLLAND C. MITCHELL, Capt. M.C., A. U. S.,  
 U. S. Veterans Administration, Hines, Illinois.

## Physical Medicine in a General Facility.

EVERILL W. FOWLKS, Capt. M.C., A. U. S.,  
 U. S. Veterans Administration, Portland, Oregon.

## Physical Medicine in Rehabilitation of War Neuroses.

ALVIN B. C. KNUDSON, Capt. M.C., A. U. S.,  
 U. S. Veterans Administration, Dwight, Illinois.

## The Effect of High Frequency Currents Over Implanted Metallic Substances.

LT. COMDR. HARRY S. ETTER, (MC) U. S. N.,  
 U. S. Naval Hospital, National Naval Medical Center,  
 Bethesda, Md.

## Rehabilitation at U. S. Naval Convalescent Hospital, Glenwood Springs, Colorado.

LT. COMDR. GLENN E. DREWYER, MC-V (S),  
 U. S. N. R.

## Activities of the Committee on Rehabilitation of the Baruch Committee.

CHARLES F. BEHRENS, Capt. (MC) U. S. N., Chief, Radiological Service, General Supervision of Department of Physical Medicine (including Occupational Therapy) U. S. Naval Hospital, National Naval Center; Member of Baruch Committee on Physical Medicine, Bethesda, Md.

ANNUAL CONGRESS DINNER  
(INFORMAL)

THURSDAY, September 7 — 7 P. M.

EUCLID BALL ROOM

TOASTMASTER: MILAND E. KNAPP, M.D., *President.*

## GUEST SPEAKERS

GEORGE F. LULL, MAJOR GENERAL, U. S. A.,  
 Deputy Surgeon General.

DAVID GRANT, MAJOR GENERAL,  
 The Air Surgeon.

LUTHER SHELTON, JR., REAR ADMIRAL.

## AWARDS

ORA L. HUDDLESTON, MAJOR, M.C., A.U.S.,  
 Chairman Awards Committee.

## GENERAL SCIENTIFIC SESSION

FRIDAY, September 8 — 10:45 A. M.

GRAND BALL ROOM

## OFFICERS OF THE SECTION

Chairman — EMIL J. C. HILDENBRAND, Washington, D. C.

Secretary — ALBERT A. MARTUCCI, Philadelphia.

## The Effect of a New Type of Gyrating Mattress on the Cutaneous Temperatures of the Extremities of Human Subjects.

GRACE M. ROTH, Ph.D., Section on Clinical Physiology, Mayo Clinic;

GORDON M. MARTIN, M.D., Fellow in Physical Medicine, Mayo Foundation,

and

CHARLES SHEARD, Ph.D., Division of Physics and Biophysical Research, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

## Marie-Strumpell Arthritis. Physical, Roentgen and Orthopaedic Therapy.

LENOX D. BAKER, M.D., Orthopaedic Division, Department of Surgery, Duke University School of Medicine, Durham, N. C.

## The Basis of Ultraviolet Air Disinfection.

LEROY J. BUTTOLPH, Sc.D., Physicist and Application Engineer, Nela Park Engineering Division, Lamp Dept., General Electric Co., Cleveland.

## The Problem of the American Spas.

RICHARD KOVACS, M.D., Professor of Physical Therapy, New York Polyclinic Medical School and Hospital, New York, N. Y.

**GENERAL SCIENTIFIC SESSION****FRIDAY, September 8 — 2:30 P. M.****GRAND BALL ROOM****OFFICERS OF THE SECTION**

Chairman — MADGE C. L. MCGUINNESS, New York, N. Y.  
 Secretary — ISRAELI KOBAC, Chicago.

**Poliomyelitis — Diagnostic Problems Encountered During an Epidemic.**

A. THEODORE STEEGMANN, M.D., Assistant Professor of Neurology and Psychiatry, University of Kansas School of Medicine, Kansas City, Kansas;  
 and  
 KATHRYN LYLE STEPHENSON, M.D., Fellow in Plastic Surgery, University of Kansas Medical School, Kansas City, Kansas.

**Kenny Treatment Combined with Neurotripsy in the Care of Poliomyelitis.**

J. WAYNE McFARLAND, M.D., Instructor in Therapeutics, College of Medical Evangelists, Los Angeles;  
 HARVEY E. BILLIG, JR., Lieut. Comdr., (M.C.), U. S. N. R.; Assistant Professor of Orthopedics, College of Medical Evangelists, Los Angeles;  
 G. MOSSER TAYLOR, M.D., Associate Professor of Orthopedics, College of Medical Evangelists, Los Angeles,  
 and  
 CLARENCE W. DAIL, M.D., Assistant Professor of Therapeutics, College of Medical Evangelists, Loma Linda, Calif.

**Treatment of Military Amputees.**

ROBERT F. DOW, Captain, M.C., Chief, Section on Physical Therapy, Percy Jones General Hospital, Battle Creek, Mich.

**Observations on Frostbite.**

CARL JOHNSON, Major, M.C., Drew Field, Tampa, Fla.

**Convalescent Program in the Army Air Forces.**

HOWARD A. RUSK, Lieut. Colonel, M.C., Chief, Convalescent Division.

**The Place of Manipulative Procedure in the Overall Treatment Rational for Painful Back Conditions.**

FREDERICK A. JOSTES, Captain, MC-V(S) U. S. N. R.

**GENERAL SCIENTIFIC SESSION****FRIDAY, September 8 — 8:00 P. M.****GRAND BALL ROOM****OFFICERS OF THE SECTION**

Chairman — MILAND E. KNAPP, Minneapolis.  
 Secretary — NATHAN H. POLMER, New Orleans.

**The Functions of a Center for Research and Instruction in Physical Medicine.**

GEORGE MORRIS PERSOL, M.D., Director, Center for Instruction and Research in Physical Medicine, Graduate School of Medicine, The University of Pennsylvania, Philadelphia.

**Medicine's Debt to War.**

ERNEST J. JAQUA, Educational Director, Baruch Committee on Physical Medicine, New York.

**The Future of Physical Medicine with Special Reference to Recommendations of the Baruch Committee on Physical Medicine.**

FRANK H. KRUSEN, M.D., Chief of Section on Physical Medicine, Mayo Clinic; Member, Administrative Board, Baruch Committee on Physical Medicine, Rochester, Minn.

**GENERAL SCIENTIFIC SESSION****SATURDAY, September 9 — 10:00 A. M.****GRAND BALL ROOM****OFFICERS OF THE SECTION**

Chairman — JOHN A. TOOMEY, Cleveland.  
 Secretary — IRVING F. HUMMON, JR., Chicago.

**Effects of Blood Circulation on Motor End Plates in Skeletal Muscle.**

EBEN J. CAREY, M.D., Dean, Marquette University School of Medicine, Milwaukee, Wisconsin.

**Studies on Muscle Innervation.**

ARTHUR L. WATKINS, M.D., Assistant, Medicine, Harvard University Medical School; Director Physical Therapy Department, Massachusetts General Hospital, Boston,  
 and

MARY A. B. BRAZIER, M.D., Research Fellow in Psychiatry, Massachusetts General Hospital; Acting Director, Electroencephalographic and Electromyographic Laboratory, Boston.

**Experimental Studies on the Electrical Reactions of Denervated Skeletal Muscles.**

ORA L. HUDDLESTON, Major, M.C., Physical Therapy Section, Fitzsimons General Hospital, Denver, Colorado.

**Results of Kenny Treatment of Infantile Paralysis in the Acute Stage.**

MILAND E. KNAPP, M.D., Clinical Assistant Professor, Radiology and Physical Therapy, University of Minnesota Hospital, Minneapolis.

**Recognition and Treatment of Common Deformities Found in Convalescent Poliomyelitis.**

ROBERT L. BENNETT, M.D., Director, Graduate School of Physical Therapy; Director of Physical Medicine, Georgia Warm Springs Foundation, Warm Springs, Ga.

**HOSPITAL CLINICS****SATURDAY, September 9 — 1:30 P. M.**

A tour of physical therapy departments in Cleveland Hospitals will be arranged.

## TECHNICAL EXHIBITS

### AMERICAN HOSPITAL SUPPLY CORPORATION.

The Sander's Vasoscillator is recognized among leaders, who specialize in the conservative treatment of peripheral vascular and cardiovascular diseases. Be sure to see the latest design apparatus, which utilizes gravity to aid the circulation without physical effort on the part of the patient. American also will display the Dickson Paraffin Bath, a thermostatically controlled unit, which gives the maximum advantages of paraffin treatment. Other interesting American Hospital Supply specialties will be on exhibit.

### ARCHIVES OF PHYSICAL THERAPY.

The leading physical therapy publication, issued monthly by the American Congress of Physical Therapy. Contains the scientific papers and addresses presented at the annual session. Other features consist of its abstract section, book reviews and physical therapy news. Subscriptions will be taken at the booth.

### THE BURDICK CORPORATION.

The Burdick Corporation of Milton, Wisconsin, will exhibit in spaces 7 and 8 their line of physical therapy equipment. Doctors and technicians are invited to register for the Burdick Syllabus, a periodical of clinical abstracts on the use of physical therapy.

### COCA COLA COMPANY.

If possible Coca Cola will be distributed to delegates with the compliments of the Coca Cola Company.

### CONFORMAL PERSONALIZED SHOES.

You are cordially invited to enjoy a complimentary trial fitting in this revolutionary new footwear advancement, perfected by the world's largest shoe manufacturer. Conformals are actually moulded to fit and support your individual arches by a remarkable plastic fitting process which automatically provides individually-balanced support by means of hydraulic action with the Conformal Plastic Arch. These shoes are made in a wide variety of smart styles for men and women and you may purchase a pair at a special professional discount while at the convention.

### E & J MANUFACTURING COMPANY.

Members and visitors are cordially invited to see an interesting demonstration of mechanical resuscitation as exemplified by the E & J Automatic Resuscitator. The respiratory rate and volume of respiration of the apparatus are controlled by the lungs of the non-breathing patient. Resuscitation, both by mask and catheter, will be demonstrated.

### H. G. FISCHER & CO.

Vital new features of shockproof x-ray construction, promised for after the war, are already today becoming available. FISCHER units show greater compactness, stability, simplicity of operation and higher efficiency in performance. FISCHER electrosurgical medical apparatus also shows new advances in design and effectiveness. You are cordially invited to visit the FISCHER display and are assured that inspection of the latest FISCHER models will prove both interesting and worth while.

### GENERAL ELECTRIC X-RAY CORPORATION.

The thoughts which you bring to this meeting, together with these we have in mind, should offer opportunities for interesting discussion. Our particular role in equipping rehabilitation clinics during and after World War I, which seems as of only yesterday, is not only reminiscent but also helps to project ideas in view of the future demands on physical therapy which you are preparing to meet. We are looking forward to your visit.

### HANOVIA CHEMICAL AND MANUFACTURING COMPANY.

A complete line of self-lighting ultraviolet lamps for general and local application will be on display. For the first time one of our new black light diagnostic lamps will be on display. Don't fail to ask for a demonstration. Confident and courteous representatives will be at your service.

### ILLE ELECTRIC CORPORATION.

The Ille Electric Corporation will demonstrate a new Combination Treatment Wading Hydrotherapeutic Tank for the after-care of Infantile Paralysis, Arthritis and other disabling conditions. Improved models of Hydromassage Subaqua Therapy Tanks, Paraffin Bath and Portable Sitz Bath will also be demonstrated.

### PAUL E. JOHNSON, MPRS.

Prescription type infra-red lamps, professional type infra-red lamps. Professional type carbon arc and mercury quartz ultraviolet lamps. Short wave diathermy oscillators. Galvanic and sinusoidal units. Supplies for all types of physical therapy equipment. Our representative will be at your service to discuss with you your physical therapy problems.

### LEA & FEBIGER.

Lea & Febiger will exhibit among their new works, Lewin on Backache and Sciatica and Kovács' "Manual of Physical Therapy." New Editions will be shown on Simmon's "Laboratory Methods of the United States Army," Rowe's "Elimination Diets and the Patient's Allergies," Rhinehart's "Roentgenographic Technique," Kraines' "Therapy of the Neuroses and Psychoses," Gershenfeld's "Urine and Urinalysis," Ballenger on the Ear, Nose and Throat, Ballenger's Manual, Ormsby and Montgomery on the Diseases of the Skin, Levinson and MacFate's "Clinical Laboratory Diagnosis," Gray's Anatomy and Kovács' "Electrotherapy and Light Therapy."

### THE LIEBEL-FLARSHEIM CO.

Be sure to stop at Booth No. 11 and see the Liebel-Flarsheim Short Wave Diathermy and Portable Bovie Electrosurgical Unit on display. Trained and qualified representatives will be on hand to greet our friends.

### MEDCO PRODUCTS CO.

The manufacturers of Litmasin pH Indicators now introduce our new 10 second Sulf-A-Test, for testing the urine concentration. This is being shown for the first time. One of our representatives will be pleased to explain this simple and accurate test. Also ask to see our pHoanol, the soapless detergent.

### MERCK & COMPANY, INCORPORATED.

Mecholyl Chloride, featured at the Merck exhibit, has been accepted by the Council on Pharmacy and Chemistry as a useful agent in the treatment of chronic ulcers, Raynaud's disease, scleroderma, chronic rheumatoid arthritis, and vasospastic conditions of the extremities.

In the treatment of these conditions with Mecholyl Chloride, the most satisfactory results are obtained by its administration by ion-transfer (iontophoresis). Information regarding this method of employing the drug may be obtained at the Merck booth No. 6.

### SCIENTIFIC EQUIPMENT MFG. CO.

An exhibit of the apparatus and procedure for the administration of ultraviolet blood irradiation therapy (Hemo-Irradiation) according to the Knott technic.

### VITAMINERALS COMPANY.

Vitaminerals extend greetings to the American Congress of Physical Therapy. It is a real privilege to cooperate with you once more and we send our best wishes through our representatives who will be on hand at our display to greet old friends and make new ones and discuss latest developments in nutritional supplementation.

### Evaluation of the Kenny Treatment

(Continued from page 420)

6. Kenny, Elizabeth: *Infantile Paralysis and Cerebral Diplegia*, Sidney, Australia, Angus & Robertson, Limited, 1937.
7. Pohl, John F., and Kenny, Elizabeth: *The Kenny Concept of Infantile Paralysis and Its Treatment*, Minneapolis, Bruce Publishing Company, 1943.
8. Peabody, F. W.; Draper, George, and Dochez, A. R.: *A Clinical Study of Acute Poliomyelitis*, Monograph 4, Rockefeller Institute for Medical Research, New York, 1912. Wilbur.<sup>10</sup>
9. Jones, Robert: *Certain Operative Procedures in the Paralysis of Children*, Brit. M. J., Dec. 9, 1911. Jones and Lovett.<sup>12</sup>
10. Wilbur, Ray Lyman: *Early Diagnosis of Epidemic Poliomyelitis*, California State J. Med. 10:418, 1912.
11. Lovett, R. W.: *Principles of the Treatment of Infantile Paralysis*, J. A. M. A. 62:251 (Jan. 24) 1914.
12. Jones, Robert, and Lovett, R. W.: *Orthopedic Surgery*, ed 2, New York, William Wood & Co. 1929.
13. McCarroll, H. R., and Crego, C. H.: *An Evaluation of Physiotherapy in the Early Treatment of Poliomyelitis*, J. Bone & Joint Surg. 23:851, 1941.
14. Harmon, P. H.: *Poliomyelitis*, Am. J. Dis. Child. 47:1179 (June) 1934. Sherman, Mary S.: *The Natural Course of Poliomyelitis*, J. A. M. A. 125:99 (May 13) 1944.
15. Draper, George: *Significant Problems in Acute Anterior Poliomyelitis*, J. A. M. A. 97:1139 (Oct. 17) 1931.
16. Aycock, W. L., and Luther, E. H.: *Preparalytic Poliomyelitis*, J. A. M. A. 91:387 (Aug. 11) 1928.

## AMERICAN CONGRESS OF PHYSICAL THERAPY

### 23rd Annual Session

September 6-9, 1944

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|                                 | 8.00 <input type="checkbox"/>   | 8.00 <input type="checkbox"/>   |  |                                  |

Name .....

(Please Print)

Address..... City.....

Date Arriving..... A.M.  
P.M.

Unless requested otherwise, we will hold your reservation until 9 p. m. of the day of your arrival.